INTERNATIONAL ABSTRACT OF SURGERY

FEBRUARY, 1918

COLLECTIVE REVIEW

LOCAL AND SPINAL ANÆSTHESIA

By ARTHUR E. HERTZLER, M.D., F.A.C.S., Kansas City, Missouri

THE literature on local anæsthesia which has appeared during the last three years may be divided in general into three classes. The first includes those papers in which the author describes his first few cases operated upon under local anæsthesia. These papers express the delight of the author at having found something that is new, and are often of value. A second class of papers is concerned with the major operations not usually undertaken under local anæsthesia, and present in a measure the extreme range of possibilities. These do not always reflect keen judgment, but are useful in that they serve to keep the audience awake to the advantages of local anæsthesia. The third class of papers include those by writers who have studied details in the technique of local anæsthesia with discernment and understanding.

On the whole, recent literature indicates a vastly widening appreciation of the advantages of local anæsthesia. A general knowledge of the subject is taken for granted and minor subjects are not considered. Abdominal surgery is being done under local anæsthesia much more generally than formerly and operations about the neck and genital organs are being accepted by many surgeons as most properly attacked under local anæsthesia.

DRUGS EMPLOYED

Novocaine is very generally the drug employed. The strength of solution generally used is one-half to one per cent with stronger solutions up to two per cent for blocking large nerves. No toxic symptoms have been recorded. McCardle (91) reports a case in which death occurred after a small amount of novocaine was used in the skin. Larger amounts of the drug are being employed than were formerly regarded as safe. Jacoby (75) used 19 grains in one case and 23 grains in another without harmful results. Daugherty (27) has used 250 ccm. of one-half of one per cent of novocaine and Jacobson (74) has used 12 ounces of one-half per cent novocaine in a case of bilateral inguinal hernia. Kroenig and Siegel (81) have used as much as 1.65 grams in a single operation. The last named authors note that these large doses cause a smaller and more rapid pulse. Morian (94) studied the urine after local anæsthesia. He found albumin in five to ten per cent of cases in amounts varying from a trace to 0.5 per thousand. It began a few hours after the operation and lasted forty-eight hours. A few casts were found. It occurs usually in patients who have postoperative vomiting. Hogan (65) thinks the kidneys are injured by the acid production from the increased muscular tonus. According to him this should be avoided by local anæsthesia. Harris (58) had one case of postoperative pneumonia in 380 cases.

Cocaine continues its reign of frightening, if not frightfulness. Engstad (39) records alarming symptoms following the instillation of a few drops of a two per cent cocaine solution into the conjunctival sac of a girl of twelve. The alarming symptoms subsided after inhaling four breaths of ether. Smith (124) finds nitroglycerine an effective antidote. He uses "small amounts" of this drug regularly in the solution in order to

forestall any unpleasant symptoms. As a matter of economy Hall (55) advises that solutions of cocaine be made in glycerine of starch. This solution does not evaporate, does not disintegrate, and may, therefore, be kept for a long time. It is suited for application to any mucous surface. Virden (137) does not believe cocaine is rendered ineffectual for use in ophthalmic practice by prolonged or repeated boiling.

Quinine and urea hydrochloride has a few advocates. Amster (7) has used it extensively in one-eighth to one-fourth of one per cent solutions. Failure to secure anæsthesia he rightly ascribes to the failure to inject the solution in the proper tissue, and sloughing he recognizes as being due to the use of too large amounts of the solution. Du Bose (33) uses quinine and apologizes for the shortcomings of the drug by the statement that it is not "fool proof." To this may be added the observation of Strachauer (133) that the important question in local anæsthesia is not what drug is used, but where and how it is injected.

The new drug apothesine has received a tryout in the hands of Allen (5) and Dyas (34). They reach the rather surprising conclusion that it is the equal of novocaine. Allen finds the addition of chloretone a disadvantage because of the smarting it causes at the time the infiltration is made. My experience with the drug would lead me to compare it with quinine rather than novocaine.

Several authors have described solutions of standard drugs under trade names. Allan (4) describes eudrenine which is, as its name implies, a combination of beta-eucain and adrenalin. Bunge (20) describes a solution of eucain containing extract of hamamelis. These combinations are evidently intended for those whose education in mathematics does not enable them to calculate the strength of solution desired.

Little new apparatus has been introduced. Most operators use simple syringes of five or ten ccm. capacity. Farr (40) describes an elaborate air pressure apparatus for forcing the fluid into the tissues. Bartlett (11) describes a syringe with a two-way stopcock, enabling the operator to fill the syringe from a container to which it is attached by means of a rubber tube, without withdrawing or removing the needle. This author describes other apparatus devised by other surgeons. The objection to such apparatus is that it complicates the technique, destroys the nicety of touch by limiting the mobility of the needle, and leads to the use of excessive amounts of the anæsthetic solution.

PRELIMINARY NARCOTIC

Most operators employ a preliminary narcotic. Morphine in one-sixth to one-fourth grain doses is generally used. Some surgeons use larger doses. McGlinn (92) uses one-fourth of a grain of morphine and one-hundredth of a grain of scopolamine, and if this is not sufficient to allay restlessness the dose is repeated in half an hour. This author feels very strongly on the subject, for he states that "to operate on a conscious patient, unless for some well-defined reason he cannot be put to sleep, is nothing less than brutality." The author gives strychnine with the last dose to counteract the depressing effects of the narcotic mentioned. Schall (111) uses pantopon instead of morphine. It is claimed for this drug that it is more analgesic and less depressant to the respiratory centers than morphine and is less likely to be followed by nausea and vomiting. Kroenig and Siegel (81) use narcophine. Hurd (71) uses one-eighth of a grain of morphine and one-hundredth of a grain of hyoscine hydrobromate to eliminate fear and psychic shock. After the use of the above dose if the patient is still apprehensive a dose of half the amount is given.

SPECIFIC OPERATIONS

Many collected case reports have been published indicating that a large number of operators are availing themselves of the advantages of local anæsthesia in a large variety of cases. In most of these standard technique is used with satisfactory results. Some of them emphasize small points of value in technique. Farr (42) calls attention to the value of elevating the abdominal wall with retractors and causing the intestines to fall away from the wound by gravity in order to facilitate exploration by inspection.

ENUCLEATION OF THE EYE

As in tonsillectomy, there seems to be no wrong way to use local anæsthesia in evisceration of the eyeball. Illig (72) describes a representative technique. He uses 2.5 ccm. of one-half of one per cent novocaine solution. The injection on the nasal sac is made just above the lachrymal caruncle and on the temporal side at the external angle of the lids. Gradle (51) attempts to reach the ciliary ganglion. He warns against this procedure except when the eyeball is to be removed.

It is of interest to note that Fernandez (44) has observed paralysis of the external rectus following spinal anæsthesia. He notes that twenty similar cases are recorded in the literature. It seems that this complication comes after the use of stovaine

only and that ultimate recovery always follows. The condition must be rare, for Boyd and Yount (18) in over six thousand anæsthesias with this drug observed no instance of ocular palsy.

OPERATIONS ON THE NOSE AND THROAT

The current literature presents a wide range of method in the use of local anæsthesia in tonsillectomy. These indicate that any method that succeeds in depositing a limited amount of anæsthetic solution about the tonsil will give satisfactory results. Wilkinson (139) gives one-half grain of codeine just before operating and then paints the surface of the tonsil with six per cent of cocaine solution. He uses one per cent alypin solution for the infiltration. He injects the anterior surface of the tonsil, the superior plica, the middle posterior surface and a few drops beneath the mucous membrane at the base of the tonsil. Thompson (135) proceeds much more simply. He injects between the tonsil and anterior pillar at the level of the lower third of the tonsil. He expects to strike the nerve at the depth of three-fourths of an inch. Lewis (88) after a preliminary injection of morphine begins by swabbing the field of operation with a four per cent cocaine solution followed in a few minutes by swabbing with a ten per cent solution. He then injects a two per cent novocaine solution in the most prominent part of the tonsil, and then in the anterior and posterior pillars. Patton (96) passes a short needle through the center of the tonsil and deposits 15 to 20 minims of the anæsthetic solution just after the point of the needle pierces the capsule of the tonsil.

Harris (57) describes his technique for the removal of the larynx. He uses the usual blocking of the cervical nerves as in thyroidectomy and in addition injects a few drops of the solution into the mucous membrane of the trachea. The pharynx, supplied by the glossopharyngeal nerve, requires special anæsthetization. He tries to avoid the pneumogastrics. It may be added that no serious consequences would ensue should these nerves inadvertently become anæsthetized.

THYROIDECTOMY

Two general plans are followed. The one represented by Lahey (84) involves injecting a layer at a time. A preliminary dose of one-fourth of a grain of morphine is given half an hour before the operation. A two per cent novocaine solution is injected directly into the skin. The incision is made at once. By this plan the tissue about the veins is injected and the vessels ligated without delay. The platisma is next injected and severed. The region along the mastoid is then injected. The muscles in front of the mastoid are now clamped and cut. The other type of operation is represented by Hertzler (61) who injects the whole field before beginning the operation. The essential points are the blocking of the cervical nerves in front of the sternomastoid muscle. The skin and muscular layers are injected, both to augment the nerve blocking and to secure the vessel-contracting action of the epinephrin.

ABDOMINAL OPERATIONS

Weiner (138) uses one-fourth of a grain of morphine three-quarters of an hour before beginning the operation and usually repeats just before the operation. An ounce of one per cent novocaine solution containing twenty drops of adrenalin then suffices for the operation. Jacobson (74) uses morphine and scopolamine.

Most operators are content to inject the actual field of operation. A few seek by the more difficult method of blocking the spinal nerves at the exit to secure anæsthesia of a wider field. Adam (1) anæsthetizes all trunks from the fifth dorsal to the third lumbar. Kroenig and Siegel (81) block the intercostal nerves from the sixth down in upper abdominal operations and from the eighth down and the iliohypogastric and ilioinguinal in pelvic operations. Jones (76) finds the method "tedious and trying," probably meaning to include both patient and operator.

PROSTATECTOMY

The removal of the prostate under local anæsthesia may now be accepted as a routine procedure. The general principle followed is that after a suprapubic opening into the bladder has been made, the capsule of the prostate is anæsthetized by the injection of the anæsthetic solution following the plan laid down by Legueu (86) in which the prostatic capsule is infiltrated through the bladder. There are as many individual variations in the method of doing this as there are operators, and I dare say each patient represents some minor variation in technique.

Barrington (10) after a preliminary injection of one-fourth of a grain of morphine injects one-half of one per cent novocaine solution into the sheath of the prostate, paying particular attention to the posterior lobes. Under guidance of a finger in the rectum he injects to a depth of one-half to one inch at this point. If pain is caused at any stage of the operation enucleation is suspended and secondary injections are made. Sherwood-Dunn (117) makes injections through five sacral foramina

and has devised an elaborate scheme for the ready localization of the foramina. In cases of obesity he passes the needle into the hollow of the sacrum between the rectum and coccyx. Eisenstaedt (37) elaborates on the technique as generally employed of infiltrating the vesical plexus by passing the needle, guided by a finger in the rectum, through the perineum to the space between the prostate and levator ani muscle, following in this the lead of Perrier (98). The objection to this method is that it requires the introduction of the finger into the rectum, a procedure always liable to carry infection even with the most painstaking changing of gloves. This is an elaboration of the method of Allen (5) and seeks to displace the sacral anæsthesia of Lewis and Bartels (87) and Hertzler (62).

OBSTETRIC OPERATIONS

Sporadic attempts at the control of pain in certain stages of labor by means of local anæsthesia have been made by obstetricians without gaining general acceptance, however. King (77) uses a two per cent novocaine solution, entering the needle two to four cm. above the lower margin of the vagina and two cm. from the rami. The needle is passed to a point just beneath Colles' fascia from two to four cm. Another injection is made between the anus and trochanter, likewise about four cm. deep.

SPINAL ANÆSTHESIA

Spinal anæsthesia is used less frequently than formerly in operations on the upper abdomen, but maintains its place in pelvic surgery, particularly in genito-urinary surgery in males. Novocaine seems to have gained a definite place tending to displace stovaine formerly more generally used. Boldt (16) uses a ten per cent solution after removing one-half to one ccm. of spinal fluid.

Although as a routine anæsthetic spinal anæsthesia is regarded as more dangerous than ether anæsthesia, a few operators employ it extensively. Extended use has shown that it is particularly dangerous in certain conditions; by avoiding these the proportionate mortality no doubt will be lessened.

Babcock's work (9) is perhaps the most notable recent communication. He employs it for an astonishingly wide range of cases. He notes that in toxic and greatly weakened conditions spinal anæsthesia is dangerous. He states that 50 per cent of patients who have had ether have headache as compared with 20 per cent after spinal anæsthesia. Boyd and Yount (18) have had an experience that entitles them to speak. In 6,229 cases they have had 4 deaths. They have mild headache and backache in 20 per cent of their cases and severe headache and vertigo in 1 per cent. They ascribe these severe cases to aseptic inflammation. The best remedy for this condition they have found to be repeated spinal puncture, removing from 10 to 25 ccm. at each sitting. Steel (129) finds that the headaches due to spinal anæsthesia yield to pilocarpine sweats. He thinks the withdrawal of cerebrospinal fluid makes the condition worse. Stanley (128) using tropococaine had headaches in 8 per cent and catheterization was required in 18 per cent. He places the patient in a Trendelenburg position of 10 or 12 degrees after using one and one-half grains of the drug dissolved in 25 minims of the spinal fluid. Deboyle (29) regards spinal anæsthesia as contra-indicated in young children, old age, recent syphilis, acute infections and febrile tuberculosis. Tuffier (136) thinks its use should be avoided in emotional subjects and in those suffering from medullary affections.

While most operators have been cautious in the use of spinal anæsthesia in conditions of great weakness, particularly in anæmic states, Huggins and Casleman (70) recommended it in general weakness of the cardiac muscle. They believe it allows the heart muscle to rest because dilatation of the splanchnic vessels during anæsthesia allows the blood to accumulate in this region, thereby causing a fall in the blood-pressure.

SACRAL ANÆSTHESIA

In general this method has followed general lines laid down by the earlier writers. The disposition to use large amounts of a weaker solution proposed by Hertzler (62) is being generally followed. Lewis and Bartels (87) for instance advise the use of 30 to 90 ccm. of the solution. These authors introduce the term "caudal anæsthesia," an innovation not generally followed, due probably to a scarcity of caudal appendages that require anæsthetization. Pickens (102) also has found that large amounts of the weaker solutions give better results than small amounts of a stronger. He also found extremely corpulent patients are not good subjects for sacral anæsthesia. He now uses a stiletted spinal needle recommended by Harris. In six cases ether was required and in thirteen local anæsthesia had to be used as an adjuvant. In those which were successful anæsthesia was complete in from six to twenty minutes.

Smith and Porter (125) believe that the fall in blood-pressure following sacral anæsthesia is due to paralysis in the splanchnic region. They believe the fall is due more to the amount of drug used than to the site of injection. A greater fall in pressure occurred when adrenalin was used than when the novocaine was used alone. The findings of these authors is opposed to the findings of Gray and Porter (53) who believe the fall is due to general muscular relaxation.

LOCAL ANÆSTHETICS FOR THE CONTROL OF PAIN

A number of years ago alcohol was quite extensively used for the injection of inoperable carcinomata. The theory was that fibrous tissue growth was thus stimulated, the rate of growth thereby being limited. The use of this drug did limit the pain. Dyas (35) has again called attention to the use of this drug for the control of pain. Alcohol can be effectively used for neuralgias, notably in the trifacial variety, by making peripheral injections only. The second branch may be reached by injecting through the labial fold. Usually the foramen can be palpated with the needle. The third branch may be controlled by injecting it at its exit from the mental foramen. The patient is spared pain if novocaine, about one-half of one ccm., is first injected. Full strength grain alcohol is then used, receiving its dilution from the novocaine solution previously injected.

The use of injections for the control of neuralgias, notably sciatica, by the injection of salt solution about the nerve is not new. Hecht (60) reviewed the literature and presented his own results. Rosenheck and Finkelstein (110) in fifty cases got favorable results in only twenty per-cent.

I regret to note that no paper has appeared on the use of quinine and urea hydrochloride for the cure of sciatica. This drug injected directly into the nerve or at least at the location of the nerve gives uniformly favorable results. The most convenient place for striking the nerve is where it passes over the neck of the femur. This bony structure gives reliable data as to the proper depth to which the needle must be passed. By successively changing the direction of the needle the nerve will be struck. The patient will indicate this event by the complaint of pain down the thigh or in the calf, sometimes even in the foot. I use four grains of the drug in an ounce of water. The patient should remain in bed a few days after the injection has been made. No fear of too extensive or permanent anæsthesia need be feared. At most the patient states that the leg feels too short or feels as if it were made of wood. The relief of pain is hailed with so much gratitude that these sensations are heralded with joy. The injections are repeated in a week. Three or four usually are sufficient to complete a cure. I have not seen it fail even in the long standing cases where a compensating scoliosis has developed.

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ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY—SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Stewart, F. T.: A Method of Gastro-Enterostomy. *Ann. Surg.*, Phila., 1917, lxvi, 334.

The author describes a method of his own for performing gastro-enterostomy without clamps. He maintains that it has no greater, and perhaps less, danger of leakage than when clamps are used. The other advantages claimed for it are chiefly that it is accompanied by less traumatism to tissues, is sure to be free from postoperative hæmorrhage, and is more readily performed.

The author's method consists in inserting a celluloid suture through the stomach and intestine at each end of the sites chosen for the new communication. By keeping traction on these sutures, the jejunum and stomach are kept in close approximation. The usual posterior stitch is next introduced. The peritoneal cavity is then walled off and incisions made in both viscera close to the line of suture exposing the blood-vessels which, with a small bit of underlying mucous membrane, are not as yet severed. The blood-vessels, usually five or six in number, are doubly secured with hæmostats and the mucosa opened between them. Taking first the posterior wall, each pair of vessels, one gastric and one intestinal, in the exposed edges is ligated with a single strand of chromic catgut, after drawing the edges together by means of the two forceps in closest proximity. These ligatures not only prevent any hæmorrhage, but hold the edges of the mucosa in firm apposition.

The anterior edges are drawn together by beginning at the end farthest from the surgeon. The two forceps which lie opposite each other are held together by an assistant. The right end of the ligature is passed around the forceps on the intestine from right to left, the left end is passed around the forceps on the intestine from left to right so that the ends emerge between the forceps, beneath the loop of the ligature. The forceps are now brought parallel to the long axis of the wound, and rolled toward each other, inverting the mucous edges of the wound. Each succeeding pair of vessels is dealt with in the same way.

The rest of the procedure is much as in the usual operation. The seroserous suture which has already been inserted along the posterior side is continued along the anterior portion and tied at its point of origin. The location of the incisions in both the stomach and intestine is determined by the usual rules laid down for gastro-enterostomy. Of the last 40 patients upon whom this operation was performed, 38 recovered without mishap, and two died, both of whom had inoperable carcinoma and succumbed to exhaustion and pneumonia on the sixth and seventh days. GATEWOOD.

Quain, E. P.: The Transverse Incision in the Upper Abdomen. *J.-Lancet*, xxxvii, 657

The author draws his conclusions from his experiences based upon 239 operations on the biliary tract, 34 upon the stomach and duodenum, 4 upon the right kidney, and 6 exploratory operations of the upper abdomen, all made through the transverse epigastric incision.

The appendix was removed through the same incision in over 30 per cent of the patients; a number of these operations were made in the presence of acute local infection and peritonitis, such as perforated gastric and duodenal ulcer, septic gall-bladder and duct and subhepatic abscesses.

Quain believes that the transverse incision has in no instance shown itself to be contra-indicated, even in the most septic condition. Only two patients have returned with any evidence of postoperative hernia. He believes that both the anatomy and the physiology of the abdominal wall are injured by cutting in a longitudinal rather than in a transverse direction, and that restoration to normal is impossible after many of the longitudinal incisions that are now in vogue. E. C. ROBITSHEK.

ASEPTIC AND ANTISEPTIC SURGERY

Brown, W. L.: What the European War has Taught in the Treatment of Wounds. *South. M. J.*, 1917, x, 809.

It is still too early to be able to reach conclusions derived from the observations of the eighty or more thousands of physicians stationed along the thousands of miles of battle front. In the present war the men are fighting in a territory which has been cultivated and fertilized for generations; the missiles are of a far more destructive type; so that practically every wound is infected, and the so-called "normal bullet wound" with its small entrance and exit wounds is almost unheard of. The first aid packet in common use in the English and French armies is of little use, because the wounds are too extensive.

The discussion between the one school headed by Wright who is opposed to chemical antiseptics and prefers the stimulation of the natural protective processes, and the other headed by Carrel and others who prefer antiseptics, has not been concluded. The majority of surgeons at the front, however, use the chemical antiseptics.

Abdominal wounds should be operated upon provided the patient is seen soon after the injury and provided a trained surgeon does the operating. The author suggests that a specially trained surgical personnel even under disadvantageous conditions can produce far better results than an untrained force fully equipped.

The two greatest dangers in war wounds, namely, tetanus and gas bacillus infection, have been very greatly reduced. The first has been practically eliminated by the routine use of antitoxin as part of the first aid procedure; and the second by means of early and free incision, excision of the devitalized tissues, removal of foreign bodies and bone fragments, and continuous chemical disinfection. The X-ray has been of invaluable assistance in the early diagnosis of gas infection, especially when the infection is subfascial. R. B. BETTMAN.

Beck, H. M.: A Report of the Results of the Use of the Carrel-Dakin Solution in Mouth Surgery. *Dental Cosmos*, 1917, lix, 974.

Beck recommends the use of the Carrel-Dakin solution as a germicide and mouth disinfectant, holding that it is more efficient, less irritating and less toxic than any antiseptic used heretofore. He advocates its usage in disinfecting the mucous membrane before hypodermic injections of novocaine-suprarenin and in the treatment of pyorrhœa.

M. N. FEDERSPIEL.

Gibson, C. L.: The Carrel Method of Treating Wounds. *Ann. Surg.*, Phila., 1917, lxvi, 262.

The author came in personal touch with Carrel and his method of treating wounds. He infers that ignorance of a method of treatment causes it to fall into disfavor. Many surgeons are using the Dakin solution without an understanding of its basic principles. Their results frequently are unsatisfactory, and the method is condemned.

The author reviews a part of "La Traitement des Plaies Infectées," by Carrel and Dehelly.

The properties of an antiseptic are to be considered from the standpoint of its irritating character, toxic power, solubility, capacity for penetration absorption, and its reaction with the proteins of the tissues. Dakin's hypochlorite of soda is a hypochlorite of soda modified to neutralize the free alkali which, when present, gives caustic properties. Hypochlorite solution combines with the proteins of the pus, and cannot be recovered as such. This is the reason why bacteria grow in a mixture of pus and hypochlorite solution. Therefore the solution must be applied continuously or intermittently.

When a wound is treated with the solution for a time, the bacteria disappear. Experiments were undertaken to determine if the sterilization is due to the Dakin solution. Tests were made with filter paper placed upon two areas of the infected wound. One piece of filter paper was treated with the hypochlorite solution while the other was treated with normal saline. After a few hours the bacteria disappeared from beneath the filter paper treated with hypochlorite, while in the other the bacteria were left unchanged and the parts appeared painful and angry. Similar results were obtained with deep wounds. Those areas upon the same extremity which were treated with the Dakin solution after a short time became painless, free from organisms, and showed a tendency to heal, while the other areas treated with dry dressings were painful, angry, and contained an unchanged number of bacteria. A quantity of pus was obtained from a grave case of tetanus; to one-half of this was added two parts of 1/100 hypochlorite solution, to the other an equal amount of .8 salt solution. At the end of an hour 1 ccm. of each was injected into guinea pigs. The one receiving the pus treated with hypochlorite survived, the other died of tetanus.

Hypochlorite is not toxic when used externally, but is dangerous when injected into the circulation because of its hæmolytic properties. When applied to a wound it causes no irritation. Its action is more marked *in vitro* than *in vivo*. Non-vascularized tissue becomes dissolved. Clots plugging vessel walls become liquefied. It is important therefore to make careful hæmostasis. Hypochlorite must come in contact with the organisms infecting the wound.

Topography of the infection was studied to determine the growth of bacteria in wounds. It has been demonstrated that at first, the organisms remain on the surface, that in the succeeding period of twenty-four to forty-eight hours bacteria develop in large numbers, penetrating the intramuscular spaces and the surrounding connective tissue. It is therefore necessary to begin early sterilization of wounds, and to remove all foreign particles, such as pieces of clothing, fragments of shells, etc. When the antiseptic solution was brought in contact with the infected surface, the number of bacteria rapidly diminished and the wound shortly became aseptic. Suppurative wounds were sterilized within twenty-four hours; those accompanied by compound fractures, in five or six days. It was difficult to bring the antiseptic in contact with the microbes in suppurating wounds.

The author outlines a technique of mechanically cleansing wounds before the administration of the antiseptic. Incision and cleansing of wounds should be undertaken with the utmost care, opening every fistulous tract, enlarging incisions, and removing all accessible traumatized necrotic tissue. Hæmostasis must be carefully performed and the extraction of projectiles and fragments of

clothing must be thoroughly carried out. When complicated by a fracture, incisions must be made to explore and cleanse the fractured ends of the bone and to remove all loose spicules. All fragments adherent to the periosteum are preserved.

The following is the method used for the administration of the Dakin solution:

The wounds are filled with a large number of small rubber tubes to carry in the Dakin solution. Each tube is about the size of 16 French, perforated at the end with a number of small holes, and usually tied off at the open end to allow the fluid to run out of the smaller holes. The fluid is introduced at a pressure of 1 meter, and on account of the numerous holes of small size the fluid is forced out very much like a spray. Each tube is destined to spray a limited section of the wound, so a very large wound may require a dozen or more tubes. These tubes are coupled up by special branch tubes of glass which lead to the tank containing the Dakin solution over the patient's bed.

The dressings are applied largely in one piece and are made very light, the theory being not to have a big dressing into which the fluid simply accumulates. The Dakin fluid is admitted by releasing the stopcock of the irrigator and allowing a prescribed quantity of the fluid to flow out into the small tubes every two hours. The amount will vary according to the number of tubes and the size of the wound. The object is to keep the wound damp without flooding it, and the exact amount of fluid has to be studied by the typical condition of each wound and by experience. The fluid is somewhat irritating and it is wise to protect the skin with yellow vaseline. The wounds are dressed daily.

M. A. BERNSTEIN.

Bashford, E. F.: Sterilization by Dakin's Solution and the Occurrence of Secondary Hæmorrhage. *Lancet*, Lond., 1917, cxciii, 595.

The present investigation had its origin in the question of whether or not secondary hæmorrhage is more frequent under some forms of treatment than in others. It was suspected that the walls of healthy vessels lying exposed in wounds might be corroded by the antiseptic solution employed. The histological investigation of vessels from which secondary hæmorrhage occurred has not lent support to this suspicion, since without exception such vessels were found to have suffered previous damage. In a few cases the damage was purely physical, and in one instance this physical injury was associated with an aseptic thrombosis. In most cases septic thrombosis was present. In others the bleeding point was surrounded by granulations, showing that corrosion was not the cause of the hæmorrhage.

Experiments were made with chloramine, Dakin's solution, eusol, flavine, iodine, and mercury perchloride. The method adopted consisted in the immersion of living tadpoles in various dilutions of the substances to be tested, the experiments conducted at a temperature of 24° to 26° C.

The following observations were made:

1. By snipping off the tail some distance from the anus and dropping it into broth, it was first ascertained that the skin of the tails of tadpoles yielded a heavy growth of gram-positive and negative organisms, bacilli, streptococci and coliform bacilli, and were therefore suitable for this investigation.

2. The lethal concentrations of the several solutions for the tadpole were then determined, and the condition of the tail as regards sterility ascertained immediately after death, the nature of the lethal action being left out of consideration as immaterial.

3. When a minimum dilution sterilizing the skin of the tail at death had been found, a new series of experiments was made to ascertain if sterilization could be effected in non-lethal solutions.

4. Thereafter the minimum time required to sterilize the tails was ascertained and then was compared with the time required to cause the death of the animal.

5. Finally the corroding or digesting action of the several solutions on the abdominal wall was noted.

The author presents tables to show that Dakin's solution and eusol are practically parallel both in their lethal effects and in their power to sterilize living tissue, the latter action taking place in half the time required to produce death; but the solutions differ in their power to digest dead tissue.

Chloramine by comparison with Dakin's solution and eusol is shown to be relatively less toxic to the animal; and the minimum time which it requires to sterilize the tail is a much smaller fraction of the time required to kill the animal, or about one-fourth of the time required by other substances.

Flavine has not the same power to sterilize the skin of the tail, sterilization having been obtained but once at death by a dilution of 1 to 2,000. Iodine and mercury perchloride have only been tested for the purposes of control.

As the question of the corroding action of Dakin's solution on the walls of healthy vessels has been raised in connection with secondary hæmorrhage, the digestive power of this solution was tested on the abdominal wall of tadpoles. One dead tadpole and another live one were put in Dakin's solution in dilutions of 1:1,000; 1:2,000 and 1:4,000. The abdominal wall of the dead tadpole was digested in these solutions in 30 minutes, 2½ hours, 3 hours and 40 minutes respectively. The abdominal wall of the live tadpole was digested in these solutions in 40 minutes, 3 hours, 3 hours and 55 minutes respectively.

It would appear that the local action of Dakin's solution was held in check by an efficient circulation, either by providing protein-containing fluid or by carrying off and rendering harmless the hypochlorites as they approach living tissue without entering into combination with them. The author thinks that his experiments are an expression of the limited extent to which Dakin's solution can injure living tissue in the presence of an efficient circulation.

Were the erosion of sound vessels the usual cause

of secondary hæmorrhage this accident would occur in practically all cases. Part of the frequency of secondary hæmorrhages may be due to improper application of the solution by pressure of the point of the Carrel tube. V. C. HUNT.

Dakin, H. D., Lee, W. E., Sweet, J. E., Hendrix, B. M., and LeConte, R. G.: Dichloramin-T in the Treatment of Infected Wounds. *J. Am. M. Ass.*, 1917, lxix, 27.

Lister first applied the principles of Pasteur in search for the perfect germicide, one that will kill pathogenic bacteria while causing no harm to cells of the living body. The lethal effect of germicides on the body cells, with the retardation and inhibition of the natural processes of repair, are well known and surgeons have relied somewhat upon soap, water, and alcohol, but chiefly on the natural bacterial resistance of the patient.

New demands are made on surgeons by the extensive suppurative wounds of modern warfare and a further search for an agent which would meet the long desired object has been effectively made. In military surgery the problem has not been the prevention of infection but one of treating infection.

Dakin's chlorin-containing solution must be made with extreme care else it irritates the skin if left in contact for any length of time.

In the Dakin-Carrel-Dehelly-DePage technique a constant immersion of all the wound surfaces is maintained; and when carried out in the minutest detail the experience of the writers has shown that infected wounds can be sterilized in a remarkably short time. While not minimizing the wonderful results obtained by this treatment, it is true that the technique requires more painstaking care, and consumes more time in carrying out the treatment and that the solution is much more irritating to the skin than the dichloramin-T, while the results from the latter are just as good.

The technique of preparing and applying the dichloramin-T is much more simple, and the skin irritant quality is eliminated. It is chlorinated oil of 5 to 10 per cent strength from which the germicide is slowly liberated over a period of from eighteen to twenty-four hours instead of thirty minutes to one hour as with the hypochlorite solution. To use the dichloramin-T treatment the wound if superficial is covered by the oil, and if deep, the cavity is filled, and needs to be replaced only once each twenty-four hours; the wound is covered with a few layers of gauze to avoid absorption of the oil.

"If we had only obtained as good results from this method as from the hypochlorites, the simplicity of the technique and the saving of dressing material would have insured its replacing the former method." F. P. HAMMOND.

Fansler, W. A.: The Use of Bacillus Lactis Bulgaricus in the Treatment of Infected Wounds. *J.-Lancet*, 1917, xxxvii, 679.

There are two main types of lactic acid-producing bacilli designated as Type A and Type B. Type A is used, since it produces approximately twice the amount of lactic acid as Type B. The strongly acid reaction produced by these bacilli makes them serviceable in infected wounds. Fansler states that they have been used with success in a number of types of wounds, including one case of hand infection, one case of empyema, one infected cyst of the face, and a large series of abdominal cases. The liquid culture is now used because it is more convenient and more potent than the dissolved tablets.

The wound is first irrigated with sterile water and the surplus fluid soaked up with gauze; then the culture is poured or injected directly into the wound. By the third day the discharge is greatly reduced and in five to seven days will have ceased almost completely. No chemical antiseptic is used, as the organism is easily killed. The wound granulates and heals rapidly.

The advantages which this method possesses over antiseptic solutions are, first, that there is a therapeutic agent of increasing strength constantly in the wound, while an antisetpic solution is soon diluted with the wound secretions and rendered ineffective; second, since the Bulgarian bacillus is present constantly, deeper penetration is obtained than in short irrigation; third, it is not destructive or toxic in any concentration, and may be readily destroyed if desired; fourth, it has the advantage over antiseptic powders of deeper penetration and of allowing free drainage; fifth, it is painless.

The author does not advise this treatment for all infected wounds, but advances it as an easily applied and valuable therapeutic agent.

CARL R. STEINKE.

Tanner, R.: A Note on the Germicidal Power of Flavine. *Lancet*, Lond., 1917, cxciii, 493.

Browning and his co-workers claim that in flavine there is afforded a germicide which is very potent and which is more active in the presence of serum than in peptone water. For the staphylococcus flavine is stated to be germicidal in 24 to 48 hours at 37° C. in a strength of 1:20,000 in peptone water and 1:200,000 in serum. Flavine is also stated to possess low inhibitory power on phagocytosis.

In the Browning technique a very small number of organisms is the subject of the test; to the author's mind this is a fallacious method of testing. He states that in all disinfectant experiments a volume containing hundreds if not thousands of organisms should be subcultured because the destruction of bacteria by a germicide follows the course of a logarithmic curve, there being an enormous destruction of organisms at an early stage, but a small number surviving for some time.

It is stated that flavine has an increased germicidal power in serum and the inference is drawn that a similar potency exists upon organisms in pus. Serum is a poor culture medium for organisms, while the purulent discharge of a wound may be swarming with organisms.

The germicidal action of flavine is so slowly

exerted that Browning adopted not less than 24 hours' contact in his experiments, and the author questions whether such a slowly acting germicide is going to supersede germicides which, even if less potent, act more quickly.

To ascertain the toxicity of flavine for leucocytes Browning incubated a mixture of flavine, serum, and leucocytes for 20 minutes. The author thinks no inference is justifiable, as the test for toxicity upon bacteria was for 24 hours, and it might be similarly slow for leucocytes.

The author's experiments resulted as follows:

1. Bacillus perfringens. A similar quantity of dust was placed into each of 8 test tubes. Recently boiled milk and flavine were added and the tubes heated to 80° C. for 15 minutes, and incubated anaerobically for 3 days. From this experiment the author shows that in a highly albuminous medium the inhibitory power of flavine upon the development of organisms of the bacillus perfringens group lies between 1:4,000 and 1:10,000.

2. Staphylococcus in broth. Five ccm. of broth were inoculated with 0.05 ccm. of a 24 hour broth culture of staphylococcus aureus and flavine added. The mixtures were incubated at 37° C. and 0.1 ccm. subcultured into the broth after 9 hours and 24 hours. This experiment showed the germicidal power of flavine on staphylococcus to lie between 1:5,000 and 1:10,000 for a 9-hour exposure, and 1:10,000 and 1:100,000 for a 24-hour exposure.

3. A similar experiment on staphylococcus in saline was made with the same results.

4. An experiment with staphylococcus in saline containing a larger number of organisms than in experiments 2 and 3, i.e., 4,000,000 cocci per ccm., showed the germicidal power of flavine to lie between 1:2,000 and 1:4,000.

5. An experiment upon human serum containing 0.05 of broth culture of staphylococcus showed the germicidal power of flavine to lie between 1:15,000 and 1:20,000.

6. Staphylococcus in pus. The pus was of a purely staphylococcic nature from an abscess of the neck. With 1 ccm. of pus was mixed 1 ccm. of the flavine solution, and after incubation loopfuls were sown upon agar and into broth. Here even 1:200 flavine did not completely kill the staphylococcus in the pus, judging from the agar subculture; and in the bro h subcultures the germicidal strength lay between 1:200 and 1:1,000.

From these experiments the germicidal power of flavine appears to be much lower than that stated by Browning and his co-workers. The results with pus are poor and many disinfectants equal or surpass flavine and have the advantage of much more rapid action. V. C. HUNT.

Stewart, D. H.: Bipping of "Blacksmithing." *Med. & Surg.*, 1917, i, 828.

Bipping is derived from "bipp," a paste composed of one part of bismuth, two parts of iodoform and one part of liquid paraffin, all well triturated and grit-free. The tissues are thoroughly rubbed with this and the wound is filled with it. Drainage tubes are not required, and when the tightened sutures squeeze the opposite walls of the wound together, any great excess of paste upon the skin may be wiped away. The bandage is applied as usual and left for two weeks. After its removal, the smear may be washed away with a grain to the ounce of iodine and alcohol.

After citing a case from Morison's article on "The Treatment of Infected Suppurating War Wounds," Stewart discusses the subject of fistulous tracts from metal screws used with metal bone plates. There may be as many of these tracts as there are screws; the skin openings may be discrete; but an injection of colored paraffin oil will reveal along the upper surface of the plate a dead space or lacuna that unites two or more of these tracts. Wherever there is such a dead space, though it be but the depth of the notch upon the head of the screw, there is a possible reservoir for a stream of septic flow. In its power of filling gaps and pits, bipp is ideal.

Stewart makes two suggestions: (1) the use of bipp when the plates are placed; (2) when a fistulous tract has formed, the employment of a long incision, exposure of the plate and the application of bipp.

P. G. SKILLERN, JR.

ANÆSTHETICS

King, E. L.: Nitrous Oxide-Oxygen Anæsthesia. *Med. & Surg.*, 1917, i, 843.

The author's report is based upon experience in 1,000 operations, ranging from curettage and extraction of teeth to major abdominal procedures, such as cholecystectomy, cholecystenterostomy, gastro-enterostomy, etc. All the operations were preceded by morphine and atropine.

The advantages and disadvantages of this anæsthetic are detailed. Caine's apparatus is pictured and described: this device transfers gas and oxygen from large to small cylinders, thus reducing the cost from that when the gas is taken primarily from the small cylinders. The author has used Crile's anoci-association technique with great satisfaction to himself and benefit to the patients. In abdominal work he has found it essential to adhere rigidly to the originator's technique.

In order to obtain the best results in the use of gas it is essential that: (1) the operator be accustomed to this anæsthetic; (2) that the administrator know the limitations of gas as well as its advantages; (3) that the patient be properly prepared; and (4) that the operation to be performed be suited to the anæsthetic. P. G. SKILLERN, JR.

Page, H. M., and White, G. B. M.: Ether-Oil Anæsthesia by the Rectum. *Lancet*, Lond., 1917, cxciii, 643.

The apparatus required is very simple: an india rubber catheter, a funnel, a medicine measure, an

empty medicine bottle with a cork for shaking the mixture; this shaking must be done forcibly for two minutes.

A simple cleansing of the bowel an hour or two before the injection in addition to the usual dose of medicine is an advantage. One-fourth of a grain of morphia, and one-hundredth of a grain of atropin is given half an hour before the ether-oil injection. From twenty to twenty-five minutes before the time of operation six ounces of a mixture of two parts of ether and one part of oil are slowly administered by the rectum, six minutes being spent in making this injection; the catheter is passed three or four inches into the rectum. When the operation is finished the remaining ether-oil must be washed out, using a large rectal tube and funnel. The washing is continued until no ether or oil can be detected in the returning fluid. Before withdrawing the tube three ounces of olive oil are passed into the rectum and left there.

The author states that in following this technique there have been no rectal, pulmonary, nor gastric sequelæ. The return of consciousness is not delayed when the washing out is done satisfactorily. The author has used this method of anæsthesia in 47 cases; all recovered from the operation except two cases of laminectomy who died of an ascending myelitis. In two of the earlier cases in which a 75 per cent solution of ether was used, there was rectal irritation, mucus and a slight trace of blood lasting a day or two. In another case there was looseness of the bowel for a few days. The author since has used a 2 to 1 solution. There is no complaint of pain during injection when a 2 to 1 solution is used.

V. C. Hunt.

Zabrocki, J. A.: Practical and Efficient Methods of Anæsthesia. *Dental Cosmos*, 1917, lix, 993.

Zabrocki condemns the open drop ether method as a crude and unscientific method, and holds it responsible for all the ill-repute that ether bears today, especially as regards nausea and vomiting. It is irregular and uneven, with a tendency to acidosis. He also condemns the so-called nitrous oxide-ether as a more dangerous method, since it has a tendency to raise the blood-pressure enormously, to make the patient cyanotic, and is responsible for many deaths.

Zabrocki advocates oil-ether anæsthesia for neurotics and in all operations upon the respiratory tract, head, neck, mouth, jaws, chest, tonsils, and for goiter and adenoids. Oil-ether anæsthesia is contra-indicated in all pathological conditions of the lower bowel, such as colitis, hæmorrhoids, ulcers, fistulæ and in emergency cases.

The advantages of oil-ether anæsthesia are the prevention of shock, narcosis of smooth and uniform depth, and nearly normal pulse and respiration. There is little or no change in blood-pressure; the reflexes are not disturbed; hypersecretion of mucus is absent; there is less hæmorrhage in mouth, head and neck surgery.

Nitrous oxide and oxygen anæsthesia he considers the luxury of all inhalation anæsthetics. It has proved to be 100 per cent efficient. By this means it is possible to anæsthetize all patients in any form of surgical operation.

M. N. Federspiel.

SURGICAL INSTRUMENTS AND APPARATUS

Campbell, J.: A Splint for the Treatment of Gunshot Wounds Involving the Shoulder-Joint. *Brit. M. J.*, 1917, ii, 480.

The treatment in a base hospital in France of a large number of gunshot wounds involving the shoulder-joint has impressed the author, first, with the great necessity for securing adequate rest and fixation combined with extension; and secondly, the absence of any useful method for attaining this. Accordingly the idea suggested itself that a splint made after the principle of a Jones abduction frame for the lower limb would prove useful in such cases.

After the use of such a splint in several instances he is quite convinced of its efficacy. The author has found that the patient can be easily cared for and the dressings changed without pain or discomfort. Furthermore, patients can be transported in it with ease.

After the period of acute sepsis subsided, the cases were put in plaster with the limb still in the abducted position, but with the elbow flexed, and holes were cut in the plaster to permit access to the wounds. The cases were then sent to England.

P. G. Skillern, Jr.

Osgood, R. B.: Adaptation of the Thomas and Jones Splints to Obtain Fixation of the Arm in an Abducted Position While the Patient is Ambulatory. *Brit. M. J.*, 1917, ii, 477.

The war has demonstrated quite clearly that the ring and wire splints of Thomas and those which Sir Robert Jones has devised are wellnigh universally adaptable. As surgeons become familiar with their use and appreciate the soundness of their simple mechanical principles, they are becoming more and more the method of choice, and the results obtained are becoming more perfect.

The principle of extension by traction and counter-pressure makes of these splints a unit apparatus which provides easy and comfortable transportation, and allows the detailed treatment in the base and home hospital to be continued with complete satisfaction without change of the apparatus, which may be and now usually is applied at the casualty clearing station or even at the dressing station. Their comparative cheapness of manufacture, their small bulk and easy packing are other advantages possessed to the same degree by no other splints with which the author is familiar. He questions the wisdom of devising other forms of splints at the present time, since the benefits of unit construction and universal use are so obvious that it seems rather that all surgeons should train themselves in their use; nor is that training difficult.

Many orthopedic surgeons have been accustomed to use plaster of Paris and feel that equally good results may be obtained with these dressings in combination with metal or plaster bridges. These bulky casts should be abandoned; they are time-consuming in application, and demand the acquirement of a certain specialized technique.

In fractures of the head or neck of the humerus and in injuries to the bones or muscles of the shoulder girdle the author has been impressed with the value of fixation with extension in the abducted position. In his experience there are a surprisingly large number of these injuries. Not only may better alignment and more speedy subsidence of the septic process be gained by the abduction, but the comfort of the patient seems greater in this position. There can be no doubt that future function also is favored. As Jones has pointed out, even a stiff shoulder with the arm in 60 degrees of abduction provides a surprisingly useful limb. As soon as the septic process begins to subside and the fever is under control, ambulatory treatment increases the resistance of the patient and greatly simplifies the cure.

The suggestions made by the author are in no way modifications of these splints, but merely adaptations which may be found to increase their usefulness. Sufficient trial has been given in the wards and in transport to England to seem to prove their practicability. Many other adaptations may easily be made. P. G. SKILLERN, JR.

Fiddian, J. V.: A Pneumatic Tourniquet for Amputations and Other Purposes. *Lancet*, Lond., 1917, cxciii, 648.

This tourniquet has the advantages that it is easily sterilized and can be easily controlled by an anæsthetist standing at the head of the patient.

The tourniquet consists of a rubber bag two inches wide and some twenty inches in length. Halfway along one edge of the bag is inserted the inlet tube in T-fashion. The inlet tube is four feet long and ends in a stout bulb which is fitted with a valve and a simple spring clip.

The bag is fitted in a cover which may be sterilized and has a leaden back to prevent rolling when distended. In use the bag is wrapped around the limb, the inlet tube passing toward the head. A two and one-half inch linen bandage is then firmly applied over the tourniquet and the bag inflated till the distal pulse disappears.

In operating upon patients with brittle arteries, less damage will be done by this tourniquet than by any other, because the pressure is just sufficient to compress the artery and can be released immediately after the artery is tied. V. C. HUNT.

SURGERY OF THE HEAD AND NECK

HEAD

Daudin-Clavaud, H.: Facial Paralysis Consecutive to War Wounds (Contribution a l'étude des paralysies faciales consécutives aux blessures de guerre). *Thèse de doct.*, Bordeaux, 1917.

Seventeen cases of facial paralysis consecutive to war wounds have been treated surgically by Moure according to a new procedure. The report deals only with paralysis consecutive to a lesion of the facial nerve in the fallopian aqueduct or in the parotid region. The facial nerve may be primarily injured by a traumatism, or secondarily as the result of infection; it may be the only nerve injured or it may be associated with injuries of other nerves. Bilateral section of the seventh pair is exceptional.

In the presence of a war facial paralysis it is of the highest importance that the surgeon should precisely locate the site of the injury of the nerve, also the exact type of lesion, whether a neuritis, a compression, or a complete or incomplete section.

Paralysis with a parotidean location is less serious than in an intrapetrous location; and among these latter the least grave are those which involve the nerve in the second or third part of the fallopian aqueduct.

Surgical intervention should be as early as possible and is contra-indicated in only one case, viz., hemiatrophy of the face.

In the case of paralysis of the facial nerve in the parotid region, the cicatrized surfaces must be opened, all thick cicatricial tissue which separates the lips of the wound removed and formation of such new tissue suppressed. If the nerve filaments are sectioned, the two ends should be juxtaposed. If the ends cannot be found, operation should be confined to approximating and suturing the deep lips of the wound.

In paralysis of the facial nerve in the fallopian aqueduct, one must proceed as in a radical cure by enlarging the tympanomastoid canal to the maximum, so that the bony portion of the fallopian aqueduct is fully exposed. The thin piece of bone covering the nerve is lifted up with a gouge. The nerve should then be followed from above downward, and any morbid alterations found are corrected. The intervention is very delicate and requires cleverness and facility, and should be undertaken only by one thoroughly familiar with the surgery of the region. The lesions of war are atypical and the alterations are numerous.

The results obtained by Moure are excellent. In 12 operations there were 6 recoveries and the other 6 recently operated upon promise at least 4 more successful recoveries. W. A. BRENNAN.

Mixter, W. J.: Fractures of the Base of the Skull at the Massachusetts General Hospital. *Boston M. & S. J.*, 1917, clxxvii, 518.

The author collected all the cases of proven or practically certain fractures of the base of the skull occurring from 1890 to 1917. He then eliminated those cases in which operation could not be considered, and also those in which the patient died from multiple injuries within two hours after his entrance to the hospital, thus leaving only the early cases of fracture of the base.

By operation the author includes only those surgical procedures which have a decompressive effect. The author's total number of cases was 301, with a total of 163 deaths or a mortality of 54.1 per cent. There were 209 cases treated expectantly, with 123 deaths, a mortality rate of 58.3 per cent. There were 92 cases operated upon with 40 deaths, a mortality rate of 43.4 per cent. The total number of cases operated upon therefore was 30.6 per cent.

Between 1890 and 1900 there were 101 cases; 9 per cent of these were operated upon, with a mortality of 67 per cent. From 1900 to 1911, there were 126 cases; 23 per cent of these were operated upon, with a mortality of 54 per cent. From 1911 to 1917, there were 74 cases; 71.5 per cent of these were operated upon, with a mortality of 36.5 per cent.

There were 7 instances of proven meningitis without operation, and 1 with operation. Proven intracranial hæmorrhage without definite localizing signs occurred 42 times; with definite localizing signs, 19 times. Operations performed within two days of the time of injury numbered 85, with a mortality of 41.2 per cent. Operations performed more than two days from time of injury numbered 7, with a mortality of 71 per cent.

The author calls attention especially to the relative high mortality in late operations. Among his statistics massive hæmorrhages were also found at autopsy or operation in 61 cases. Sixty per cent of this number showed indefinite or no localizing neurologic symptoms.

In such conditions a right subtemporal decompression is performed for the reason that this area is a silent one and uncovers that portion of the base most frequently injured, the middle meningeal artery. It permits thorough exploration of that portion of the skull and brain. The left-sided subtemporal decompression uncovers the speech center, and a traumatism or pressure is liable to cause a paralysis of the power of speech. The author advises early decompression in proper cases of fracture of the base of the skull. L. H. Hills.

Christopherson, J. B., and Chalmers, A. J.: Fractured Base of the Skull; the Subsequent History of a Case and Its Termination Twenty-Four Years After the Accident. *Lancet*, Lond., 1917, cxciii, 458.

In March, 1917, the authors saw the patient, a man of sixty-five, who complained of discomfort below the occipital region of the head. He had a temperature of 104° F. He became unconscious and apopletic the next day, and never regained consciousness. The only additional symptom was inequality of the pupils, the right being fixed. Death occurred 84 hours after illness began.

Nearly twenty-four years previously he received a fracture of the skull; he remained unconscious for twelve weeks, finally recovering but with the loss of taste and smell. He appeared to recover completely, except that any worry or exertion caused his head to ache. This, however, was relieved by rest in bed and the administration of aspirin.

At postmortem a small abscess, the size of a thumb nail, was discovered in the frontal lobe. The pathologists report that "sections of the frontal lobe of the brain contained Gram-positive diplococci in chains, some of them having Gram-negative elements." These diplococci, separate and in chains, have been found several times in the Anglo-Egyptian Soudan. E. C. Robitshek.

Courtney, J. W.: The Temperature as a Valuable Guide to Diagnosis, Prognosis, and Surgical Treatment in Craniocerebral Traumatisms. *Boston M. & S. J.*, 1917, clxxvii, 511.

In diagnosing craniocerebral traumatisms the author considers the most important sign the associated temperature, because of the fact that neurologic symptoms are often confusing and not clear-cut. A pial œdema may often cause the same neurologic symptoms as hæmorrhage from the middle meningeal artery, and a contusion may vary from the slightest injury to the point of rupture of the brain itself.

In uncomplicated intracranial hæmorrhage there is immediate shock associated with subnormal temperature, followed by a slight rise of not more than one degree, this temperature usually persisting throughout the course of the case. On the other hand, in uncomplicated contusion the temperature usually rises quickly from subnormal to as high as 102°, followed by marked remissions of two or three degrees in the morning, to be followed again by another rise in the evening, temperature gradually coming down to normal in favorable cases. In brain lacerations the rise is usually not so rapid but is much higher, and the author considers a persistent high temperature a positive indication of lacerated brain following craniocerebral traumatism.

In considering the complications of intracranial injuries he calls attention to the chills, which are not uncommonly present in simple contusion and do not in any sense denote pus formation; in arachnitis they are usually absent. A sudden jump in temperature several days after trauma accompanied by signs of cortical irritation, such as delirium, restlessness, etc., usually denotes an arachnitic process. The average temperature may be as high as 103° with frequent, often hourly, fluctuations.

The temperature of a cerebral abscess may be normal or subnormal even after the abscess has

developed to proportions sufficient to cause local manifestations. However, this is not constant; following an antecedent process the abscess may develop before the activity of this process has disappeared, in which event the temperature may remain high throughout.

The author offers these facts as a practical working basis sufficiently constant to guide in a diagnosis and in prognosis and treatment. L. H. HILLS.

Derache, P.: Trepanation in Cases of Gunshot Injury of the Cranial Vault (Note sur le devenir des trepanés d'apres l'observation de cas de blessure de la voute par projectile de guerre). *Bull. et mem. Soc. de chir. de Par.*, 1917, xliii, 1754.

Of 165 injuries of the cranial vault reaching the author's ambulance within a period of two years, 27 died immediately without emerging from a state of coma. Of the remaining 78 cases in which surgical intervention offered some chance of success, 3 died from causes not attributable to the cranial injury. In 74 cases there was a primary trepanation. These cases composed 21 closed meninges; 38 open meninges without retained intracerebral projectile; 15 open meninges with non-extracted intracerebral projectile. In the latter cases the projectile was too deeply embedded to be extracted. In the 74 cases there were 15 deaths within one month, 4 being due to cerebral abscess and 10 to meningitis.

During the following seven months there were 7 more deaths, 5 due to cerebral abscess. There were 9 cases of precocious epilepsy mostly jacksonian in type; 12 cases developed a free cerebral hernia, 8 of which died. Where a hernia develops the prognosis is especially grave, particularly if there is a retained projectile. There were 52 survivals after the eighth month and there have been no further deaths. Forty of these cases date from one and one half to two and one-fourth years after operation. The 52 survivals comprise: 16 closed meninges; 19 open meninges without retained projectile; 15 intracerebral projectile cases. The author draws particular attention to the long tolerance of deeply embedded intracerebral projectiles.

The author gives the final mortality results with prolonged survival as follows:

In cases with closed meninges, 0 per cent; in cases with open meninges and retained projectile, 35.9 per cent; with intercerebral projectile, 60 per cent.

Surgical treatment has resulted in prolonged survival of more than 60 per cent of the cases operated. Neurological examination of the survivals show that in the cases with closed meninges 22.2 per cent and in the cases with open meninges 13.3 per cent are absolutely normal. W. A. BRENNAN.

Fracassi, T.: Serous Encysted Meningitis of the Posterior Cerebral Fossa; Operation; Recovery (Meningitis serosa enquistado de la fosa cerebral posterior; operacion; curacion). *Rev. méd. d. Rosario*, 1917, vii, 288.

The case reported by the author occurred in a woman of 26 years and apparently originated after an experience of intense emotion which caused an endocranial hypertension. From the symptoms a tumor of the left posterior cerebral fossa was diagnosed, the nature not specific.

A trepanation was done following Krause's technique and the dura exposed. As punctures were negative, it was decided to incise the dura on the affected side. No alterations could be observed in the aspect or consistency of the cerebellar superfices. The hemisphere was explored with the index finger. Toward the anterior face an encysted collection was opened and citrinous contents of about 20 to 30 ccm. withdrawn. Suture and closure followed further exploration. The postoperative course was uneventful. All symptoms of endocranial hypertension, cephalgia, vertigo, etc., disappeared. The patient was up after fifteen days. Four months later she was seen and was in perfect health. W. A. BRENNAN.

Villandre, C.: Deep Abscesses of the Brain Secondary to Cranial Wounds (Abcès profonds du cerveau sécondaires à des plaies du crâne.) *Lyon méd.*, 1917, cxxvi, 420.

The study of three cases of previous cranial gunshot injuries with late abscess formation has shown Villandre that cellular brain abscesses set up a reactive defense process such that the infected part of a ventricle becomes completely isolated from the rest of the cavity. The lateral ventricles seem to defend themselves from slow infections as well as from very neighboring abscesses.

The three cases are striking examples of latent microbism susceptible to sudden activity in old cranio-encephalic wounds suppurated for a long time through fistulization. In one of the cases the agent was the streptococcus and in the other two the staphylococcus.

Surgical treatment in these cases being particularly difficult, the author was confined to preventive and disinfecting procedures. This comprised filiform drainage and repeated evacuatory cerebral punctures. One of the patients died, the other two are in process of recovery.

The author draws attention to the necessity of early and thorough disinfection of cranial injuries to prevent formation of fistulæ, and also to the requisite supervision of such injuries for a long period. W. A. BRENNAN.

Andrews, E. W.: Hæmangioma of the Brain Inoperable by Ordinary Methods, Treated by Boiling Water Injections and Hot Metal Point. *Surg. Clin. Chicago*, 1917, i, 965.

The patient, a woman 44 years old, had well-marked focal symptoms referable to the right Rolandic area, papillitis, optic atrophy, and slight seizures pointing unmistakably to brain tumor. There was paresis in the face, arm, hand, and leg of the opposite side and progressively increasing headache and loss of vision.

The large parietal plastic flap made over the

affected area disclosed a slightly discolored outer table of the skull, and bluish vessels showing through the thin bone in an unusual way. The first trephine opening exposed pulsating nevi of the diploe and had to be sealed with Horsley's wax. The trephine was then placed at an adjacent point, and on slight pressure broke through the thinned outer table, opening large sinuses which seemed part of a hæmangioma occupying the place of the inner table, diploe and meninges to an unknown depth. The bleeding was arterial in strong pulsations and had to be held by pressure.

The outer wound was tamponed with bits of catgut and little grafts of the patient's muscle, which controlled the bleeding without great pressure. Subsequently boiling water in 1 to 4 ccm. charges was injected, puncturing the scalp and thin bone with a stout needle. After a few daily repetitions of this injection, the patient was again operated upon. The external carotid was ligated and on re-opening the wound, a very bloodless scalp and pericranium was found, but no cessation of the pulsation in the vascular mass. This demonstrated that its blood-supply came from some deep connection with the cerebral vessels and made free dissection unsafe. Doubtless in such a cavity bleeding could be stopped by packing against the bony margins, but at the cost of producing an intracranial hæmatoma of dangerous extent.

Large cautery points of heated copper were used, the ordinary soldering irons of the tinsmith; they were pressed firmly against the bleeding masses after the old horseshoe-shaped flaps were reflected by removing the stitches of the first operation. This caused wide and deep coagulation, although not entirely checking the bleeding. Bone, pericranium, and probably the dura and a certain layer of deeper tissue were devitalized but not charred, the irons being of a dull and not a glowing heat. Over the eschar the pericranial flap was again sewed.

Primary union took place with no drainage and no delay in clean healing. The immediate relief from this treatment was very marked. There was no increase of paralysis; rather, a decided improvement set in. The eye-grounds cleared remarkably. As to the end-result, a most conservative prognosis is advisable. EDWARD L. CORNELL.

Roger, H.: Influence of Compression and Cerebral Emboli on the Blood-Pressure (Influence des compressions et des embolies cerebrales sur la pression sanguine). *Arch. de méd. expér.*, Par., 1917, xxvii, 591.

Experimental research on rabbits and dogs made by Roger lead him to conclude that cerebral emboli produce very marked changes in the arterial pressure. There is at first a slight lowering of the pressure, soon followed by an elevation. It is shown in different organs and especially in the suprarenal capsules. Illustrated tracings are shown.

The author made special research in order to discover if superactivity of the suprarenal capsule was concerned in the hypertension. Rabbits were used, and the suprarenal capsules removed. In such decapsulated animals there is a temporary elevation. After about 36 seconds the pressure returns to normal and then continues to fall until about 45 per cent depression is obtained. During this latter period there are crises of unilateral convulsions, with passing slight elevations of the pressure. The importance of the suprarenal capsules in maintaining the arterial pressure consecutive to cerebral emboli is observed by comparison of the various tracings.

The author thinks that the clinical deductions to be drawn from his conclusions are that variations in the blood-pressure of patients attacked by cerebral lesions should be looked for. These permit a differentiation between apoplexy and shock; they make evident the intervention of the suprarenal capsules in maintaining hypertension in the course of apoplexy. W. A. BRENNAN.

Sharpe, W., and Farrell, B. P.: Cerebral Spastic Paralysis Due to Hæmorrhage; a Further Report of the First Sixty-Five Cases of Cranial Decompression for Selected Cases. *J. Am. M. Ass.*, 1917, lxix, 1056.

The patients were carefully selected, only those with signs of persistent intracranial pressure being chosen; these constituted less than 25 per cent of the cases examined. Ophthalmoscopic examination revealed dilated retinal veins and blurring of the optic disks; in the later cases, these findings of increased pressure were confirmed by the measurement of the cerebrospinal fluid at lumbar puncture by the use of the spinal mercurial manometer. In all cases there was a history of prolonged and difficult labor at birth, most of them being instrumental deliveries. A negative Wassermann of both blood and spinal fluid was obtained in every case except one. No selection was made as to age, spasticity, or mental deficiency. Microcephalic children, cases of agenesia, and those due to meningo-encephalitis were naturally excluded as nonoperable, there being no increased intracranial pressure.

The pathologic condition, as found at operation and postmortem, was noted. A definite fibrous cystic formation was invariably present. This lesion was supracortical in all but four cases, the others being subcortical or cortical. The cysts were punctured and their outer walls removed; fibrous formation was removed except in cases in which its removal would have caused damage to the underlying tissue; in these cases it was left alone.

After-treatment consisted in the correction of deformities by tendon lengthenings, stretching of muscles, tendon transplants, etc., massage, and careful muscle education with special attention toward establishing an improved co-ordination.

Of the 65 patients, 9 died after operation, and 8 have died in the past two years, making a total of 17 deaths. The authors have been unable to obtain any record of 4 patients; 19 show practically

no change; 25 show improvement more or less marked. The youngest patient was two and one-half years of age, and the oldest seventeen years.

When epilepsy is a complicating factor, the prognosis is invariably bad. The immediate results were gratifying in that the convulsive seizures were less frequent, but this improvement lasted only for a few months. The younger the child, generally speaking, the more marked has been the improvement. The older the child, the less marked the improvement. In the adult cases there has been practically no improvement. Supracortical lesions are the only favorable cases; in this type damage to the nerve cells is due to pressure alone from the overlying lesion. In the cortical or subcortical lesions, there is, naturally, a definite destruction of brain tissue, and only in those cells along the edges of the cyst that are suffering from pressure can any improvement be expected.

The authors make an appeal for better preventive means in avoiding this condition. First, more care on the part of the obstetrician is needed; careful pelvic measurements should be made as early as possible; prolonged labor should be avoided whenever possible; practitioners should realize that cæsarean section is less dangerous to mother and child than is the use of the high forceps; during the first few weeks of life every child should be as carefully inspected for symptoms and signs of intracranial hæmorrhage as for deformities. When these symptoms and signs are present, cranial decompression should be performed as early as possible in those selected cases in which the fluid or clotted blood can be removed before any or little permanent damage to the brain tissue has taken place.

In this manner the writers believe that the number of children suffering from this form of spastic paralysis can be reduced, and that the most severe cases can be prevented or improved. The essential points to be emphasized are the early diagnosis and early treatment of these selected cases. Nine of these infants have been operated upon the day after birth, with excellent results.

P. G. SKILLERN, JR.

Willems and Albert: Lumbar Puncture in War Surgery (La ponction lombaire en chirurgie de guerre). *Bull. et mem. Soc. de chir. de Par.*, 1917, xliii, 1780.

The author thinks that lumbar puncture is not used in war surgery as much as it deserves. It has given excellent results in craniocerebral lesions and their complications.

In cranial traumatisms without external wound, puncture will tell whether there is only a simple concussion or a basal fracture. When there is a post-traumatic syndrome of vertigo, headache, vomiting, etc., puncture will show if there is a simple hypertension or a localized compression.

In simple hypertension, puncture is curative. Simple cerebral concussion is typical of this condition. A single puncture will often suffice, but several may be necessitated.

In basal fracture also, puncture is curative. It is the best method of decompressing the base of the brain. In severe cases the authors make a daily withdrawal of 20 to 40 ccm. They have obtained success in dangerous cases.

When jacksonian epilepsy is due to some irritating agent, such as a projectile, bone particle, etc., and this cause can be diagnosed, the only logical treatment is removal. But when the source of such complications is obscure, lumbar puncture is a valuable resource. In such cases if puncture fails to bring about a successful result, it is almost certain that there is a cause which must be sought by a craniotomy. The authors operate only for post-traumatic epilepsy after having made a series of punctures without improvement.

For the reduction of a cerebral hernia in the early stages lumbar puncture is very efficacious. If a sufficiently large extraction of fluid is made, a complete reduction of the tumor is effected even at the first attempt. But daily punctures must be repeated, and it will be observed that at each treatment the tumor becomes smaller and smaller, and that it will disappear after eight or ten days. If it should reappear, puncture is again done.

The authors describe four cases of meningitic post-traumatic complications treated by lumbar puncture.

W. A. BRENNAN.

Barány The Open and Closed Treatment of Gunshot Brain Wounds (Die offene und geschlossene Behandlung der Schussverletzungen des Gehirns). *Nord. med. Ark.*, Stockholm, 1916, xlix, *Kirurgi*, H. 6, No. 20.

Barány was shut up in the fortress of Przemysl for nine months during the siege and in this time he treated more than half of the cases of brain injury that needed surgical care.

Although like others he at first was inclined toward conservative treatment and delay for the development of symptoms before operating, this policy was soon abandoned in favor of early operation. In the earlier cases the greatest trouble was experienced from the development of brain abscesses after operation. This was found to be the result of imperfect drainage of the wound after an otherwise faultless operation. Many cases were lost from this cause. Jeger, Kuttner's assistant, then suggested that the American cigarette drain be tried. It was found that complete drainage was best obtained by using thin strips of gutta-percha paper carefully introduced into the depths of the abscess.

By this method healing of all abscesses was obtained. While it is possible to heal brain abscesses, no way has been found thus far to cope with cases of encephalitis, which generally end fatally. There were only about 2 or 3 recoveries out of 120 of such cases in Przemysl.

Barány has been led to the view that the open

method of treatment is not the only one proper in every case, as he had previously maintained, but that there are many cases where the closed treatment will give results, and which would have resulted fatally with the open treatment.

Barány summarizes his conclusions as follows:

1. The soft parts of the projectile trajectory are to be excised.

2. The brain wound is to be trimmed free for about ½ cm. beyond the dura edge.

3. All contaminating matter as hairs, bone-splinters, etc., are to be cleared from the wound. Bone splinters are to be removed carefully with the little finger.

4. In case of serious loss of dura substance, if circumstances permit, the brain orifice is to be covered with a strip taken from the fascia lata of the upper limb, the smooth side being turned towards the wound.

5. The wound is to be closed perfectly without drainage.

6. In segmental wound where the bone has been driven into the brain, the procedure is exactly similar to 1 regarding tangential injuries.

7. In segmental shots where the bone has only been splintered between the bullet openings without having entered the brain, the entrance and the exit orifices of the bullet only are to be excised, the bone splinters removed and complete suturing done.

8. For transverse through and through shots, the same procedure as in 7 is followed.

9. When a projectile is retained, it is to be removed whenever possible. For this the position of the patient is important. The patient is to be placed in such a position that the bullet trajectory is in an exactly vertical downward position with the side where the bullet entered. The bullet should then fall out by force of its gravity. Whether the bullet can be removed or not, the skin wound is to be closed and covered with fascia lata.

W. A. Brennan.

NECK

Walton, A. J.: A Series of Fifty Cases of Exophthalmic Goiter Treated by Operation. *Practitioner*, Lond., 1917, xcix, 309.

In an analysis of 50 cases of exophthalmic goiter treated by operation, Walton makes the following deductions:

A great many of the bad results are due to errors made in selecting the type of case for operation and the time when the operation should be performed. Each case must be kept in bed and watched for a sufficient time to permit the course of the disease to be recognized; operation should be undertaken only when the symptoms are in a period of relative abeyance, taking into consideration the length of time the disease has existed and the occurrence of visceral changes, the most common of which is dilatation of the heart.

The operative technique is as follows:

The patient is referred to the hospital without any knowledge that an operation is to be performed, put to bed, and kept there until the time is selected for the operation. During the period of waiting, the patient is given per rectum saline injections of one pint daily. On the day of operation, one-half hour before the time selected, she is given a mixture of equal parts of olive oil and ether in place of the saline. Seven ounces is the amount usually given to an adult woman. If necessary, the ether may be preceded by a hypodermic injection of morphine, one-fourth of a grain and atropine, one-hundredth of a grain, the aim being simply to allow the patient to be taken to the operating room in an unconscious state, when ether is given on an open mask. When the patient is fully anæsthetized, a sand bag is inserted under the shoulders to throw the thyroid gland forward, and the field of operation is shut off by towels which are stretched to the patient's skin. The collar incision of Kocher is used. There must be no pressure applied to the gland and all bleeding must be controlled; this can only be performed by a process of gentle dissection, each vessel being isolated and securely ligatured before it is divided.

As soon as the patient is put back to bed the rectum is washed out to remove the remains of the olive oil and ether, and a pint of saline is injected. These injections are continued until the stage of reaction, lasting from one to four days, has subsided.

Walton divides the period after operation into five stages:

1. The stage of reaction lasting from two to four days.

2. The stage of primary improvement lasting for two or three weeks.

3. The primary relapse lasting for two or three months, from which gradual recovery is made.

4. The stage of instability when the patient is apparently cured.

5. The complete cure.

He says that much may be done to shorten the third and fourth stages and to hasten the onset of complete cure by seeing the patient at short intervals and carefully noting the condition. It is his custom to give every patient a slip with the following printed rules, which are based on those given by Ochsner:

Live a quiet life and avoid all forms of excitement, such as theaters, shopping, politics, etc.

Obtain as much rest as possible by going to bed early and taking a midday nap.

Have an abundance of fresh air, especially at night, and sleep with open windows.

Avoid all stimulants, such as tea, coffee, alcohol, or tobacco in any form.

Avoid meat and all meat broths and soups. At most, a little beef, mutton, or chicken should be taken once, twice, or three times a week.

Take as much milk as possible and foods prepared with milk, such as milk toast, cream, and buttermilk.

Eat cooked vegetables, fruit, either cooked or very ripe, eggs, bread, buttered toast, rice and cereals.

Drink plenty of good water. If its purity is at all doubtful, the water should be boiled before drinking.

The author has had a mortality of 4 per cent among his patients; 84 per cent are able to return to work and lead normal lives. G. W. HOCHREIN.

Shambaugh, G. E.: Ludwig's Angina. *Surg. Clin. Chicago*, 1917, i, 849.

A man 20 years of age complained of swelling in the floor of the mouth and the glands of the neck, especially on the right side, together with intense pain in this region and inability to close the mouth. There was great difficulty in swallowing. The affection began with a sore throat about one week before his admission to the hospital. The swelling in the mouth was raised to the level of the lower teeth and was board-like in resistance. It was impossible to see the faucial tonsils. The mucous membrane on the floor of the mouth, as well as the sides of the tongue, was covered by dry whitish exudate. There was no discoloration of the skin nor any evidence of fluctuation. The temperature ranged from 101 to 103° F. The leucocyte count was 16,350. Cultures from the mouth showed an almost pure growth of streptococci. The treatment consisted of hot, moist dressings about the neck, alkaline mouth wash, and morphine to reduce pain. Six days after admission pus began to ooze from an opening somewhere under the tongue. The infiltration under the tongue increased in size and hardness, and on the tenth day was opened, followed by the discharge of about 2 drams of thick yellow pus. Recovery was rapid.

CARL R. STEINKE.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Chapin, H. D.: A Comparison Between the Clinical Examination and Roentgenograms in Diseases of the Chest. *Am. J. Obst.*, 1917, lxxvi, 704.

A comparison between the clinical examination and roentgenograms was made in 15 heart cases and 97 lung cases. In the former, the two examinations agreed in 7 of the 15 cases, partially agreed in 1 case, and 7 failed to show any correspondence in the conclusions reached by the two methods.

In regard to the lung cases, there was a substantial agreement in 77 cases, and a disagreement in 20 cases. Clinical examination indicated lobar and bronchopneumonia in 5 cases, when the X-ray failed to show such lesions, and the X-ray demonstrated lobar pneumonia in 5 cases, not found by clinical examination.

The author found Espine's sign of considerable diagnostic importance in diseased conditions at the root of the lung. He states that all so-called central pneumonias are in reality peripheral pneumonias.

W. L. BROWN.

Percy, J. F.: A Technique for Radical Cautery in Breast Cancer. *Ann. Surg.*, Phila., 1917, lxvi, 397.

Modern surgery has recognized the necessity of preventing bacterial infection of the operative field. According to the author, the same principle should be observed in the operative surgery of carcinoma so that autotransplantation infection shall be prevented. The author suggests the cautery knife as a valuable substitute for the cold steel knife because it disseminates heat and heat kills the infecting organism of cancer. All tissues involved in cancer should be manipulated in the most gentle manner possible. The author has seen no untoward results from the use of heat, even when large areas of the thorax, axilla and neck were denuded of their coverings. Necrosis of the ribs frequently follows the operation, but it has never been seen to go below the edges of the intercostal muscles; and pleurisy or pneumonia rarely develops. The majority of the patients are remarkably free from pain. Flaps can be made in the same way as with the ordinary knife.

The procedures in heat technique are as follows: Mark out on the iodine-covered skin with the cautery knife the limits of the incision to be made. Then lift up the skin with a tenaculum forceps, push the hot knife into and under the skin, and cut from within outward. Otherwise too great sloughing of the skin will result. In dissecting about the axillary vessels and brachial plexus, hold the tissues that are to be removed with the free hand encased in a medium weight rubber glove, keeping the fingers close to the cautery knife. This is the most practical way of gauging the degree of heat that the blood-vessels and tissues will stand without injury. Apply the heat until all the tissues that were fixed by the disease are freely movable. GATEWOOD.

Bevan, A. D.: Benign Tumors of the Breast, Chronic Inflammations, and Carcinoma. *Surg. Clin. Chicago*, 1917, i, 889.

Contrary to the older teaching that benign tumors in the breast are comparatively rare and that nine-tenths of the breast tumors are malignant, the author has found at least as many benign tumors as malignant. He suggests the following simple classification of tumors of the breast:

The common benign tumors come under the head of fibro-adenomata and cyst adenomata. These include the Schimmelbusch tumors, the benign papillomata and the benign cysts. The rarer benign tumors are the angiomata, lipomata, chondromata, osteomata, atheromata, and dermoids.

The malignant tumors are carcinomata and sarcomata. Sarcoma of the breast, in the author's experience, is a comparatively rare neoplasm. Fibro- and cyst adenomata and carcinomata form more than 95 per cent of the breast tumors coming to his service.

The differential diagnosis is discussed, and also tuberculosis, syphilis and chronic abscess in the breast. Three cases are reported, one a simple cyst, one a fibro-adenoma and the third a Schimmelbusch tumor.

Where multiple abscesses and fistulæ of the breast are handled by simple incision and the introduction of drainage tubes, they very often become chronic and are not cured. Practically all can be cured by a thorough operation under a general anæsthetic, opening up all the abscess cavities and scraping out the fistulous tracts; drainage tubes should not be introduced, but moist dressings under a very firm compression bandage should be applied.

Flat sea-sponges are compressed to one-fourth of an inch in thickness and applied under the bandage. They are moistened with boric solution. This exerts an even, well-distributed pressure over the breast. EDWARD L. CORNELL.

Piqué, R.: Two Cases of Immediate Thoracotomy for Thoraco-Abdominal Wounds (Deux cas de thoracotomie immédiate pour plaies thoraco-abdominales). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 1796.

The first case reported by Piqué was a man with an orifice wound the size of a franc situated about 4 cm. to the left of the right nipple. Radioscopy showed a foreign body in the neighborhood of the diaphragm. A Delorme flap was made without fracture of the ribs, and the abundant hæmothorax was evacuated. Small perforations found in the inferior lobe of the lung were not sutured. The liver dome was perforated; the foreign body was extracted from the hepatic parenchyma. Recovery followed.

In the second case a lumbothoracic perforating wound at the right side traversed the diaphragm. The projectile was in the superior lobe of the lung. Operation was done as in the preceding case and the projectile extracted. The projectile had in this case traversed the diaphragm and all the inferior lobe of the lung. The perforation in the inferior lobe was not treated. The man died on the seventh day of pleuropulmonary septicæmia.

This case illustrates the importance of disinfecting the whole of the track of the projectile. Autopsy showed that the upper part of the track had cicatrized well after extraction and suture, but that the lower part, which was not treated, was the starting point of a fatal pleuropulmonary septicæmia. W. A. BRENNAN.

Lilienthal, H.: Empyema of the Thorax. *Ann. Surg.*, Phila., 1917, lxvi, 290.

The author reports his observation of one hundred cases of empyema of the thorax treated by major and minor thoracectomy over a period of three years, from March 25, 1914, to March 25, 1917. These cases were operated upon regardless of the prognosis and regardless of the source of the pus. There were 64 cases under twelve and 36 over twelve years of age, and about twice as many males as females. The mortality was 23 per cent, showing a 5 per cent improvement over the cases treated during the ten years previously reported. No thoracoplastic operation was done in any of these cases; those patients who recovered remained in the hospital about thirty-seven days, on an average. This represents a gain of one week over past records. E. B. FREILICH.

Richter, H. M.: Empyema; Simple, Interrupted and Continuous Aspiration. *Arch. Pediat.*, 1917, xxxiv, 696.

The writer attributes the high mortality of empyema in children to the following three factors:

1. The intoxication of suppuration.
2. The loss of proteid material from prolonged suppuration.
3. The collapse of the lungs.

Death may occur from these factors after any drainage operation, but the first can more readily be controlled by some form of drainage. The simplest form of treatment is the removal of the greater part of the pus by several interrupted aspirations; sudden and complete evacuation of a pleural effusion of any considerable size is essentially wrong. In draining the pleura it is necessary to obliterate the pleural cavity as quickly as possible by drawing the lung up to the chest wall, and this is best accomplished by one of the modifications of Perthe's method of continuous aspiration. By its means the lung can be kept fully inflated and complete obliteration of the pleural space will quickly ensue. In this way the flow of fluid from the broad surfaces of the large suppurating pleural cavity can be reduced. E. B. FREILICH.

Whale, H. L.: A Note on Mediastinitis as a Cause of Heart Failure. *Lancet*, Lond., 1917, cxciii, 495.

After a massive gunshot wound of the neck, resulting in a gangrenous cavity which involves most of one or both anterior triangles, the possible causes of death are secondary hæmorrhage, septicæmia, or septic pneumonia. In a second class of cases there is a cellulitic spread of infection initiating retropharyngeal infection. Drainage here is easy, but lower down toward the thorax it is more difficult.

A third type of case presents an insignificant wound anywhere about the neck with no signs of local or general inflammation consistent with increasing difficulty in swallowing or breathing. Stereoscopic skiagraphy shows a foreign body very deeply placed. In less than 48 hours the pulse and respiration rate have increased alarmingly. Adequate surgical drainage and cardiac stimulants are unavailing and in a day or two without the appear-

ance of illness the patient dies. The cause of death cannot be assigned to shock, septicæmia, nor heart failure.

The author cites three such cases in which autopsy showed a deep abscess or purulent lymph involving both vagi.

In general, the temperature is very irregular. It may rise to 104° and again fall. It may remain high or normal for an hour or for two days. The most characteristic feature is the sudden alteration of pulse and respiration rate. This startling alteration, especially if accompanied by an altered size or mobility of one or both pupils, indicating involvement of the sympathetic, forms a symptom complex. The diagnosis is vagitis due to mediastinitis.

As regards treatment, cardiac stimulants are of no avail; surgical cleansing of the wound down to the spine is no safeguard. In the after-treatment of very deep wounds in the neighborhood of the thoracic inlet, posture seems important. The patient should lie, if not on his face, at least semiprone on the affected side, with the head low. But with the acceleration of pulse and respiration orthopnœa is persistent and it is not possible to keep the patient lying down. The anatomical difficulties of good surgical drainage at the thoracic inlet are great. V. C. HUNT.

TRACHEA AND LUNGS

Iglauer, S.: Foreign Bodies in the Bronchi. *Interst. M. J.*, 1917, xxiv, 924.

The author reports two unusual bronchoscopic cases with special instruments used in extraction, and a case of spontaneous expulsion of an upholstery tack from the right bronchus.

A boy, aged six years, swallowed a steel-jacketed bullet and was taken to the hospital three days later. The physical findings and roentgenogram indicated complete obstruction of the left bronchus. A Kahler bronchoscope was introduced but it was impossible to grasp the foreign body with the ordinary forceps and so a flexible forceps was employed and the bullet withdrawn. It was 25 mm. long and 7 mm. wide. The use of a flexible forceps has some advantages when the tactile sense is employed in extraction, since there is but slight danger of traumatizing the tissues with such an instrument.

The second bronchoscopic case was that of a boy aged 12 years who swallowed an umbrella ferrule. The physical findings and roentgenogram indicated that, although the foreign body was a large one, a by-pass for air could be diagnosed. A Kahler bronchoscope was passed and a thimble-like body, with its wide end uppermost, was located firmly impacted in the right bronchus. The first attempt at removal of the foreign body was unsuccessful because the various kinds of forceps which were repeatedly applied slipped off and traction seemed to tilt the foreign body and draw its sharp edge into the opposite bronchial wall. The operation was discontinued pending the manufacture of a special extractor; this consisted of a long brass rod with a tapering screw thread at one end which was intended to be screwed into the hole in the end of the foreign body on the principle of a bolt and nut. On the following day a low tracheotomy was made under local anæsthesia to obviate the possibility of the foreign body becoming dislodged and fixed crosswise at the tracheal bifurcation or stripped off below the vocal chords. A short 9 mm. Jackson bronchoscope was introduced and the foreign body located. The special extractor was then screwed into the hole in the foreign body which was easily withdrawn until the tracheal opening was reached, when it was stripped off. It was immediately seized with a forceps and extracted. It was 15 mm. long and 10 mm. in its widest diameter.

The third case was that of a little girl, aged six years, who swallowed an upholstery tack. She was taken at once to the hospital where a roentgenogram showed the tack lodged head downward in the right bronchus, opposite the fourth rib posteriorly. The child was given 1/200 of a grain of atropine and sent to the operating room; but the operation was postponed for a short time until a suitable forceps could be be obtained. Soon afterward the child coughed up the tack. Factors favoring spontaneous expulsion were the short sojourn, i,e., three or four hours, of the foreign body; the rest in bed; and the administration of atropine which possibly relieved the spasm of the bronchus. The tack proved to have but a moderately sharp point. E. B. FREILICH.

Jackson, C.: Caisson Bronchoscopy in a Lung Abscess Due to a Foreign Body. *Surg., Gynec. & Obst.*, 1917, xxv, 424.

The author reports a case of a pin in the lung, which had been swallowed five years before. Caisson bronchoscopy was used in its removal. The author concludes that while caisson bronchoscopy was unsuccessful in finding the foreign body in this case, the usefulness of the method in the exploration of the interior of the lung abscess and the safety of such exploration were demonstrated. It seems probable that a larger foreign body or one not in an eccentrically located pocket could be so found.

The new malleable-ended forceps are useful in conjunction with localizing roentgenograms made with ordinary straight forceps in position at endoscopically known stations.

Numerous other points, though not entirely new, are important, especially: (a) the absence of reaction following careful bronchoscopy under local anæsthesia in adults; (b) the absorption of less pus owing to improved drainage following dilatation of the strictured orifice of the abscess cavity; (c) the corrosion of steel in the lung without disintegration sufficient to permit coughing out, probably because of the firm enclosure of fibrous tissue; (d) the localizing value of the anteroposterior and lateral roentgengrams with the bronchoscope and forceps at various stations of which the endoscopic landmarks are known. H. H. FREILICH.

Takenska, S.: The Macroscopic and Microscopic Findings in the Lung after Unilateral Removal (Ueber makroskopische und mikroskopische Befunde an der Lunge nach einseitiger Extirpation). *Mitt. a. d. med. Fakult. d. k. Univ. zu Tokyo*, 1917, xvii, 339.

The author reports 21 experiments performed on rabbits, cats, and dogs. From his findings he draws the following conclusions:

1. Removal of the lung on one side leads to enlargement of the other lung. The enlargement is not noticeable at once but becomes distinctly visible after a few months.

2. It is observed that the alveoli of the remaining lung dilate in the beginning and assume a larger volume irregularly; finally they again become of uniform size.

3. An increase in weight is observed in the remaining lung and in the heart. This increase in the heart is not always found on the right side.

4. The enlargement of the lung is probably due to new formation of alveoli and small bronchial branches.

5. Freund's and Moellgard's theories regarding occurrence of emphysema were not verified. Bohr's theory has more validity, in the author's opinion.

6. The relative position of the other thoracic organs is only very moderately influenced by the removal of one of the lungs. The remaining lung, the heart, and the organs in the mediastinal space maintain their normal positions. Nor is there to be noticed a conspicuously high displacement of the diaphragm. The chest wall flattens, however, on the operated side.

7. As Hellin emphasized, the vascular supply to the remaining lung is considerably increased after unilateral lung removal. This congestion, however, gradually recedes with time. W. A. BRENNAN.

HEART AND VASCULAR SYSTEM

Derache: Three Cases of Cardiac Projectiles (Note sur trois cas de projectiles cardiaques). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 1759.

Derache reports three cases in which he extracted a cardiac projectile successfully.

In two of the cases the projectile was a rifle bullet, in one case encysted in the posterior wall of the left ventricle behind the apex, and in the other case resting on the left auricle. In the third case the projectile was a piece of shell lodged in the posterior wall of the left ventricle under the auriculoventricular ridge. W. A. BRENNAN.

Delorme, E.: Contribution to the Study of Cardiac Surgery (Contribution a l'étude de la chirurgie cardiaque). *Bul'. Acad. de méd.*, Par., 1917, lxxviii, 243.

The case reported by Delbet to which Delorme refers was that of a soldier in which radiologic and stereoscopic examination showed a projectile situated in the right heart. The Delorme thoracic flap was practiced, the fifth rib fractured and the pericardium detached with the finger. When the heart was reached, the right edge was incised for about 3 cm. and the foreign body in the cavity of the right ventricle was moved by pressure of the fingers toward the opening, whence it was extracted by a Kocher forceps. The index finger and the thumb kept the lips of the wound tight so that only a few drops of blood escaped. With Chaput's intestinal needle and No. 2 catgut a few non-perforating sutures were then rapidly placed. The wound was closed and dressed. The projectile was found to be an irregular cube of steel, one side of which measured about 1½ cm.

The operation lasted three-quarters of an hour. Recovery followed. General and stethoscopic examination made 38 days after operation showed symptoms of pleuralpericardial symphysis, tachycardia with instability of pulse, absence of arrhythmia, exaggeration of the oculo-cardiac reflex and diminution of the resistance.

Delbet concludes from his operation that the procedure is extremely simple and without any sensational incidents. With regard to this case Delorme reviews 17 cases of intervention reported in French literature for intracardiac projectiles. He gives short summaries of these cases; 3 were foreign bodies in the right lobe, 1 in the left lobe, 2 in the left ventricle, 8 in the right ventricle and 3 in the apex. A distinction is made between parietal and cavitary foreign bodies. The case reported by Delbet is of the latter kind.

Delorme records the following indications for and against operation:

1. When there is persistent pain, disturbed sleep, and extreme pain with violent palpitation on the least movement, operation is clearly indicated, whether or not the projectile penetrates and whether it is parietal or cavitary.

2. If the disturbances are slight and the projectile is parietal, the indications are rather against intervention. A small foreign body can become encysted and remain harmless indefinitely.

3. If the disturbances are slight, the projectile if situated in the left lobe should not be interfered with; if the projectile is regular it may be left wherever situated, but if irregular and jagged, intervention is called for.

Regarding the lasting effects of such operations, the known findings augur well and seem to favor intervention. Of a total of 13 operations made in France, there have been 3 deaths. Four operations made for foreign bodies in the right ventricle have all resulted successfully. W. A. BRENNAN.

PHARYNX AND ŒSOPHAGUS

Hayem, L.: Treatment of Penetrating Chest Wounds at the Front (Notes sur le traitement des plaies penetrantes de poitrine à l'avant). *Presse méd.*, 1917, p. 627.

Since April, 1917, the author has treated 52 wounds of the lung and mediastinum reaching him

directly from the first aid posts. Within the first twenty-four hours after injury he operated upon: (a) penetrating wounds with a single entrance orifice and with a large projectile or one which menaces a large vessel; (b) wounds with a large thoracic breach. He has never had to operate on account of hæmorrhage. Cases which do not result in immediate death from hæmorrhage usually develop a hæmothorax which the author has respected for at least twenty-four hours on account of the spontaneous hæmostasis.

In all other cases abstention has been the rule, i.e., in seton wounds or single orifice wounds with a very small projectile. Twenty-three such cases cured spontaneously and were evacuated between the thirtieth and fortieth days. In 4 cases the projectile, though small, was troublesome and a secondary operation was necessary. Such interventions are very difficult on account of adhesions and pleural suppuration usually occurs. For such reasons the author has decided to operate in all cases except those involving extremely small projectiles.

The author's experience leads him to adopt resection of the fourth rib as the approach of choice. As an approach to the mediastinum, the lung, the pleural cul-de-sac, or for dissection of the hilus region, this resection gives a sufficiently large opening to view the conditions from the pleural dome to the diaphragm and from the sternum to the vertebral column. Besides permitting rapid and easy intervention there is a minimum of operative injury.

The skin and muscle incision is made about 3 cm. beneath the fourth rib and parallel to the course of the rib. The muscular cutaneous layer up to the fourth rib is then lifted up. After resection of the rib the pleura is incised for the whole length of the wound. The intercostal muscles are also incised for about 2 cm. at their insertion in the superior edge of the costal cartilage corresponding to the resected rib. The cartilage is not resected.

The pneumothorax produced, which completes a preceding incomplete one, has never caused any cardiac or respiratory disturbances.

The author describes his treatment of the lesion according to the situation of the projectile to be extracted, whether in the pulmonary parenchyma, in the mediastinum, or in the pleura.

The results show that 42 per cent had an immediate operation; 44 per cent benefited definitely by abstention. There were 8 deaths, a mortality of 16 per cent; but most of these were in patients with the thorax largely opened by the trauma. The author thinks that while abstention is a beneficial procedure in penetrating chest wounds when its indications are limited, thoracic surgery gives excellent results. W. A. Brennan.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Hull, A. J.: The Cure of Inguinal Hernia. *Brit. M. J.*, 1917, ii, 518.

Hull has charge of a special department of the British medical service for the cure of herniæ, dealing with cases at the rate of about 500 per year. The high percentage of soldiers who have inguinal hernia has made the problem of their treatment a serious one. Trusses are almost useless. The operation of choice is the one which will cure the hernia and render the man fit for service in the least possible time. The principle of the operation best adapted to this end, and found highly satisfactory, is the removal of the sac at the highest possible level with a minimum disturbance of tissues.

The technique is as follows: One-half per cent novocaine (with adrenalin) is infiltrated midway between the anterior superior spine and the pubic spine, and one-half inch above Poupart's ligament. The whole anæsthesia is conducted through this puncture without withdrawing the needle. Incisions are made one-half to one inch in length over the needle puncture down to the aponeurosis of the external oblique. Fibers of the external oblique are split one-half inch. Cremasteric and spermatic fascial coverings of cord are drawn through the aperture; the cremasteric fibers are separated and the spermatic fascia incised. The sac lying inside these coverings is opened between mosquito forceps. Omentum, if present, is drawn out, ligated, and cut off. The inside of the sac presents two apertures, the internal ring and the inguinal canal. The two openings are separated by a fold of peritoneum, the crista, corresponding to the inner margin of the internal ring. Forceps are placed on the crista and the tube of peritoneum leading into the abdomen is separated by cutting through this fold. The neck of this tube or sac is now pulled out gently and ligated as high as possible, which is about two inches above the internal ring. When the sac is cut, distal to the ligature, the elasticity of the peritoneum will displace the ligatured sac well behind the rectus muscle.

In 90 per cent of the cases this is all that is necessary. The skin incision is sutured with silkworm passing down to and including edges of the external oblique. In cases in which a large internal ring or a very thin peritoneum renders recurrence more possible, the conjoined tendon is drawn over the cord and sutured to Poupart's ligament without enlarging the incision. By enlarging the incision in the external oblique a typical Bassini may be done.

Recurrence is usually immediately after the patient gets up, and is due to faulty ligature of the sac.

Troublesome sequelæ such as hydrocele, retraction of the testicle, thickening of the cord, neuralgia, etc., due to injury of the spermatic cord, are avoided. The operation is performed above the matted scar of recurrent herniæ almost as easily as if primary.

CARL A. HEDBLOM.

GASTRO-INTESTINAL TRACT

Thalhimer, W., and Wilensky, A. O.: The Extent of Tissue to be Excised for a Radical Removal of Carcinoma of the Stomach. *Ann. Surg.*, Phila., 1917, lxvi, 421.

The authors' investigation was made for the purpose of determining the minimum amount of tissue adjacent to small carcinomata of the stomach wall which must be resected in order to secure a complete operative removal of the malignant process in those cases in which the regional lymph-nodes apparently are not involved and in which there are no demonstrable metastases.

From their evidence they conclude that in small carcinomata of the stomach, situated elsewhere than at the pylorus, the malignant process is so limited in extent that local resection at a distance from one to two centimeters beyond the macroscopic limits of the tumor will in the majority of instances remove the entire tumor.

The authors wish it understood that it must not be assumed from these observations that the accepted methods of surgical treatment of carcinoma of the stomach, such as pylorectomy or partial gastrectomy, are not necessary for a thorough removal of the diseased tissue. They emphasize the fact that such methods should be employed wherever possible.

The clinical significance of their investigation is two-fold:

Inasmuch as the surgeon frequently makes a local excision of an ulcer in the belief that the latter is benign in character, these investigations show that such a local excision is sufficient for a radical removal of the malignant process even if subsequent pathological examination shows the ulcer to have been carcinomatous in character. Of course such a local excision would be radical only when metastatic glandular involvement is not present.

When a malignant tumor is situated at the cardiac end of the stomach, the surgeon may either do a complete gastrectomy or consider these cases inoperable. The serious consideration of complete gastrectomy is almost forbidden in these cases because of the high mortality of this operation. Local excision of the tumor is a far less dangerous procedure, and, since the authors' investigations have shown that such local excision is sufficient for the removal of the malignant process, these tumors become accessible for radical operative treatment. Such excision again is only radical provided no metastases are present.

G. W. HOCHREIN.

Webb, R. C.: Operative Treatment of Hour-Glass Stomach. *Ann. Surg.*, Phila., 1917, lxvi, 418.

Webb reports a case of hour-glass stomach due to an ulcer, in which the pyloric pouch was three times as large as the cardiac pouch. The pylorus was obstructed by a large callus, apparently a cicatrized ulcer. A double posterior gastro-enterostomy was performed, without an enterostomy between the two loops. Two months after operation the patient was free from symptoms and had gained thirty-two pounds. X-ray pictures taken at this time showed that the stomach emptied rapidly and both gastro-enterostomy openings were working well.

G. W. HOCHREIN.

Wolkoff, A. A., and Klopfer, E. E.: Gastric Digestion of Various Foodstuffs After Gastro-Enterostomy. *Lancet*, Lond., 1917, xcxiii, 568.

In experiments on dogs the authors found that with the pylorus open, food left the stomach both through the pylorus and the anastomotic opening. The most liquid part of the food came through the pylorus, while the more solid constituents came through the anastomosis. H. J. VAN DEN BERG.

Palmer, D. W.: Hyperplastic Pyloric Stenosis. *Ann. Surg.*, Phila., 1917, lxvi, 428.

Palmer offers four reasons for presenting this subject: First, he believes this condition has been and is frequently overlooked; second, he wishes to bring out some of the essential features in the diagnosis; third, he wishes to comment on some of the surgical features and complications; and fourth, he desires to emphasize the fact that excellent results are obtained by surgical intervention with comparatively slight risk.

He believes that all cases of congenital pyloric obstruction have a constant pathology that rests on a far more tangible basis than any "spasm theory." He points out the similarity of the obstruction symptoms produced by prostate obstruction and congenital pyloric hyperplasia to prove the inability of spasm alone to produce the syndrome associated with the latter condition. He believes that the œdema from increased muscular effort, or a fold of mucous membrane, or a curd of milk may be the factor to close a pylorus already narrowed by too great an amount of sphincter muscle.

A large majority of the cases are first-born males, breast fed, and perfectly well at birth, with healthy parents. The appearance of symptoms depends on the amount of hyperplasia of the pylorus. In a percentage of all cases, even where the obstruction is most acute, it is impossible to palpate the pyloric tumor because of the overhanging liver or the posterior position of the pylorus. If the tumor is palpable, it verifies the diagnosis, but if not, it by no means makes negative the diagnosis. The tumor often becomes palpable after the patient is anæsthetized. Some cases require immediate surgical operation and others yield to medical treatment. All cases should be carefully watched.

The vomiting of a simple gastric or gastro-intestinal disturbance, intestinal colic, and other forms of obstruction and injuries from various foods must be differentiated. One of the author's cases operated for pyloric stenosis proved to be a case of infantile merycism or rumination.

He brings out the fact that pyloric stenosis has associated with it an unduly high percentage of cases of thymus enlargement. Another less serious complication is a postoperative discharge from the skin wound.

The average age of his eight living operated cases was seven and two-fifths months at the time last heard from, and the average weight was seventeen and two-fifths pounds, or one pound above the normal Holt average. G. W. HOCHREIN.

Downes, W. A.: A Case of Giant Duodenum. *Ann. Surg.*, Phila., 1917, lxvi, 436.

Downes reports a case of giant duodenum in a child of four and one-half years. The child weighed 6 pounds at birth and 29 pounds on admission to the hospital. He had had frequent fits of vomiting since birth, with periods of one to two months' freedom.

At operation the stomach appeared normal with possibly a slight thickening of the wall; the pylorus was normal, and the duodenum was dilated to the size of the stomach. The wall was smooth and three or four times thicker than normal. No diverticula, adhesions, or peritoneal bands were present. Distention involved the entire length of the duodenum, ending abruptly at the point where the gut passed under the superior mesenteric artery. No effort was made to determine the nature or cause of stenosis. The usual posterior gastro-enterostomy was performed.

One month after operation the patient was readmitted to the hospital almost in collapse, with distended abdomen and subnormal temperature. The abdomen was re-opened. It was found that the ligature had cut partially through and that there was a free communication between the stomach and duodenum. A new ligature was applied. The child improved for the first forty-eight hours following operation and then began to complain of pain in the epigastric region; at the same time a slowly forming mass could be felt in the right upper quadrant. On the fifth day after repeated enemas and the use of pituitrin the bowels began to move freely and the child continued to improve. There was no return of the symptoms.

The author believes that duodenojejunostomy best meets the indications in the giant type of duodenal dilatation and should have been adopted in his own case. G. W. HOCHREIN.

McKenna, H.: A Case of Perforated Duodenal Ulcer. *Surg. Clin. Chicago*, 1917, i, 1063.

Etiologically, duodenal ulcers have a definite relation to focal infections, such as are found in the mouth, ears, sinuses, etc. They are hæmatogenous in nature, as in appendicitis. The author reports a very interesting case of acute appendicitis following an attack of streptococcic tonsillitis, in which the same organism was recovered from the tonsils and the appendix.

In diagnosis, much dependence is placed on the history and the X-ray findings. History is typical as to periodicity, the attacks usually occurring in autumn and spring. Hunger, pain, particularly at night, vomiting and rapid gastric peristalsis are generally present.

All cases of ulcer of the pylorus and duodenum with constriction should be handled surgically and a gastro-enterostomy made. In all cases where the ulcer is not removed the scar should be covered by means of a purse-string suture, or a flap of omentum. Surgical treatment is imperative in cases of ruptured ulcer.

In the case of perforated ulcer reported by the author, there was a sudden onset of pain of such severity that the patient fell practically unconscious. Two hours afterward on arrival at the hospital he was semi-comatose, very anæmic and suffering extreme pain in the upper abdomen. The right side of the abdomen was rigid; there was no blood in the vomitus. White blood count was 14,000. A right rectus incision was made. The perforation was found in the duodenum; it was closed with Lembert sutures in such a way as to increase the lumen of the duodenum. A pedicled flap of omentum then covered the line of sutures.

The patient made an uneventful recovery.

C. A. BOWERS.

Jopson, J. H.: Intussusception in an Infant; Resection; Recovery. *Ann. Surg.*, Phila., 1917, lxvi, 500.

Jopson reports the case of an infant seven months old who developed colic after a bowel movement, followed by persistent vomiting, not fæcal.

The abdomen was soft and scaphoid, but not tender. A visible and palpable oblong tumor two by three and one-half inches was found in the lower portion in a median line below the umbilicus. Rectal examination disclosed no tumor, but blood and mucus were voided. There was no bowel movement after the attack. The temperature was 100.6°, the pulse 152, and respiration 38.

At operation intussusception of the small bowel was found. Rectification was attempted, but a constriction at the upper portion of the bowel made it impossible. The bowel was resected and a Murphy button used in an end-to-end anastomosis. On the sixth day the abdominal incision opened, and a few coils of intestine protruded. Under chloroform anæsthesia the coils were replaced, drainage instituted, and after a vacillating convalescence the child recovered, and at this time is eighteen months old. The operation involved the removal of more than fifteen cm. of the intestine.

M. A. BERNSTEIN.

Decusatis, H., and De Grossi, E.: Chronic Intestinal Occlusion by Adherent Hernia (Occlusion intestinal cronica por hernia adherente). *Semana méd.*, Buenos Aires, 1917, xxiv, 321.

The patient was a woman of forty-nine who showed a tumor diagnosed as a right crural strangulated hernia; on the left side there was another crural hernia which was apparently irreducible. The patient had symptoms of intestinal obstruction. She was operated upon and about 20 cm. of the large intestine resected, the ends joined by an end-to-end anastomosis. The patient made a successful recovery.

The case is interesting because of the symptomatology of chronic intestinal occlusion due to a left adherent irreducible crural hernia and also an acute occlusion by the strangulation of the patient's right crural hernia. Operation and histological examination showed that there was hypertrophy of the descending colon by a partial obstruction of the intestinal lumen, this hypertrophy being purely functional in origin. W. A. BRENNAN.

Harrigan, A. H.: Torsion and Inflammation of the Appendices Epiploicæ. *Ann. Surg.*, Phila., 1917, lxvi, 467.

These hitherto neglected anatomical structures may be the seat of pathological conditions which can simulate an acute abdominal lesion. In the case reported by the author the onset was sudden, the principal symptom being severe pain in the right lower quadrant. A diagnosis of acute appendicitis was made, but after the appendix was found not inflamed, search was made for other conditions sufficient to give rise to the symptoms. At the middle of the convexity of the sigmoid an appendix epiploica was found acutely inflamed and was removed.

The article concludes with a complete review of all of the published cases of disease of the appendices epiploicæ. D. N. EISENDRATH.

McKenna, H.: Early Recognition and Treatment of Acute Appendicitis. *Surg. Clin. Chicago*, 1917, i, 1069.

The author emphasizes the necessity for a campaign of education as regards the early recognition of acute appendicitis. He cites several cases where the diagnosis was overlooked and procedures undertaken which were distinctly harmful to the patient.

The symptoms of acute appendicitis and their order of occurrence are:

1. Pain, usually epigastric and cramp-like in nature, shifting to the right lower quadrant in twenty-four hours.
2. Nausea and vomiting; probably due to traction upon the appendix and meso-appendix.
3. Rise in temperature, usually occurring in the first twenty-four hours.
4. Leucocytosis. A differential count should be made to see if there is a relative polymorphonuclear leucocytosis.

Differential diagnosis will exclude:

1. Ruptured tubal pregnancy, marked by cessation of menstruation, sudden severe pain in the lower abdomen, abdominal distention, anæmia, nausea and vomiting, rapid pulse, subnormal temperature, increased leucocyte count.
2. Acute gall-bladder, marked by acute pain in the upper right quadrant radiating around the right costal arch to the back and sometimes to the right shoulder, vomiting, sometimes jaundice.
3. Acute pancreatitis, marked by sudden onset of agonizing epigastric pain and persistent vomiting, severe collapse, weak and rapid pulse, belching and hiccoughs, distention of the upper abdomen, and acute anæmia. Sugar may be found in the urine.
4. Stone or disease of the right ureter or kidney, marked by sharp pains in the bladder and penis and in the right leg. Blood or pus may be found in the urine. Ureteral catheterization, with X-ray, may verify the diagnosis. The Murphy hammer stroke will elicit pain in the region of the kidney.

There is practically never a fatality if the patient is operated upon within the first twenty-four hours. In suppurative cases the appendix is removed if it is in the field, but it is not disturbed if by doing so there is danger of disseminating the infection.

C. A. BOWERS.

Jackson, W. R.: Megacolon; Megasigmoid. *Ann. Surg.*, Phila., 1917, lxvi, 441.

Jackson reports a case of megacolon in a male 22 years of age. For two years before operation he had had serious obstipation and great abdominal distention, especially in the upper abdomen, which strong purgatives failed to relieve.

Operation revealed all the colon to be moderately dilated and the sigmoid sacculated for its entire length. The sac was the shape of the stomach, measured 21 inches in length and 18 inches in circumference, and was about half-filled with fæcal matter. The walls were thick and white in appearance. Excision of the whole sac or the dilated segment was done between two clamps and an end-to-end anastomosis by suture was made. The patient made an uninterrupted recovery. Two months after operation his condition was good and he had gained 15 pounds in weight. His appetite and digestion were normal.

The author states that the prognosis is grave in most cases with or without operation, but more recently the operative statistics have improved considerably. G. W. HOCHREIN.

LIVER, PANCREAS, AND SPLEEN

Saussine, A., and Bertrand: Primary Cancer of the Liver in a Girl of Eleven Years (Un cas de cancer primitive du foie chez une fille de onze ans). *Arch. de méd. d. enf.*, Par., 1917, xx, 472.

There are only a few cases known of primary cancer of the liver in infancy, and it is rare under the

thirtieth year. The author relates the details of a case of primary epithelioma with a syndrome simulating an attack of appendicitis. The patient was a girl of eleven years who was finally sent to the hospital with a diagnosis of liver abscess. An operation of urgency was performed and the liver exposed and examined without any positive findings. The child died 8 days later. Autopsy showed the liver vastly enlarged and on its superior and posterior face a knobby whitish tumor. Histologic examination showed that the tumor was an epithelioma and its character showed that it was primary. There were no metastases.

W. A. BRENNAN.

Dennis, W. A.: Acute Empyema of the Gall-Bladder. *J.-Lancet*, 1917, xxxvii, 595.

The author's records for the past two years show that 20 per cent of gall-bladder cases were operated upon for acute empyema.

When a stone becomes impacted in the cystic duct a condition of hydrops of the gall-bladder develops, the gall-bladder containing clear mucus and no bile. When a stone becomes impacted in the pelvis of the gall-bladder, hydrops does not develop, but in all cases of empyema this was found to be the location of the impacted stone. In explanation of this it is thought that because of the anatomical relations of the cystic duct and the cystic artery, a stone impacted in the pelvis of the gall-bladder produces pressure upon the cystic artery, interfering with the blood supply to the organ, lowering its resistance and rendering conditions more favorable for the development of an empyema. When the stone is impacted in the cystic duct there is no pressure on the cystic artery.

In acute empyema of the gall-bladder there is typical colic, the pain persisting for several days, ameliorated by morphine but not completely relieved. Fever appears, not infrequently accompanied by chills. Jaundice is usually not present. The gall-bladder is usually easily palpated in the absence of Riedel's lobe. Tenderness is a definite sign. An empyemic gall-bladder by adhesions and ulceration at times empties a part of its contents into the bowel.

Surgical treatment is indicated as soon as the diagnosis is made if the patient's condition warrants it. Where there is acute toxæmia proctoclysis with bicarbonate of soda and glucose for a few hours allows operation to be undertaken with comparative safety. Delay should not be too great, as rupture of the gall-bladder may occur.

The operation of choice for empyema is cholecystectomy, for several reasons, i.e., lesser dangers of wound infection, certainty of not leaving an overlooked stone impacted in the pelvis, the avoidance of a second operation, more prompt and safe recovery. The chief contra-indication for cholecystectomy is a general condition so bad that an anæsthetic is unwarranted, in which case simple drainage under local anæsthesia can be done. With a co-existing stone in the common duct, the stone may be removed and then cholecystectomy done.

V. C. HUNT.

Leede, C. S.: The Physiology of the Gall-Bladder Under Normal and Morbid Conditions. *Northwest Med.*, 1917, xvi, 298.

The author attempts to solve the problem of when to drain and when to remove the gall-bladder. He has determined that the normal bile found in the gall-bladder is six to ten times richer in solids than bile found in the bile-ducts. In other words, 40 ccm. of normal gall-bladder bile is equivalent to from 240 to 400 ccm. of bile-duct bile. By reason of absorption of the inorganic salts by the gall-bladder, a change in the bile is produced which makes the gall-bladder bile less destructive when injected into the tissues than the liver bile. The mucosa of the gall-bladder also produces large amounts of mucus which possibly serve as a protection to the duodenum against the action of HCl.

He also believes that in all probability, although he has been unable to prove it definitely, there is a hormone secreted by the gall-bladder into the bile, which has a great influence upon the production of HCl in the stomach, and thereby of secretin in the duodenum. The bile-ducts and gall-bladder with the sphincter muscle of the choledochus are supplied by the splanchnic and vagus nerve. The existence of the sphincter muscle has been recently demonstrated by Rost. Irritation of the splanchnic nerve causes dilatation of the gall-bladder and bile-ducts and possibly contraction of the choledochus sphincter muscle, while irritation of the vagus nerve causes contraction of the gall-bladder and bile-ducts and relaxation of the sphincter muscle, the sphincter thus regulating the flow of bile.

The first morsels of food taken into the stomach cause the gall-bladder to eject some of its thick bile into the duodenum, where its hormone causes the secretion of HCl in the stomach. Food alone does not cause HCl to be secreted. As soon as the HCl enters the duodenum the mucosa of this organ causes the production of secretin, which is absorbed and acts upon the liver and pancreatic cells, causing a production of the respective juices Meat and the products of protein digestion, therefore, because of the increased amount of HCl produced, which again produces more secretin, have the greatest influence upon the production of bile. Fats influence the bile production to a lesser degree, and water and carbohydrates hardly at all. Milk causes a strong flow of bile of long duration. Bile and bile-salts either taken by mouth or injected directly into the duodenum cause a strong flow of bile, and are therefore the greatest cholagogues.

Reach showed that morphine, adrenalin and pilocarpine caused a contraction of the sphincter choledochi, papaverine relaxing the sphincter and releasing the bile without increase in quantity. Carlsbad sprudel causes decrease in bile, salicylates increasing the flow. The so-called cholagogues,

mercury and phosphates, have no immediate effect upon bile production. The author reasons therefore that the real cholagogues are those foods and digestives which cause the increased production of secretin, and with it the increased production of bile and pancreatic juices. With reference to pancreatic secretion the author has found that normal production of acid of the stomach is the controlling factor in the action of the pancreas. Meat causes a strong flow of juices, but bread and carbohydrates are however the most powerful stimulant.

Rost found that animals without a gall-bladder secreted only one-third the amount of bile and pancreatic juice of normal animals, even though normal stomach contents were injected into the duodenum. He believes this is due to the lowered production of secretin, as it could not be due to the reduced HCl. The chyme of a normal dog containing a normal amount of HCl does not increase the production of bile to normal in a dog without a gall-bladder; it is obvious from this that with the loss of the gall-bladder something else is lost, probably the hormone.

Ohly of Cassel found that after loss of function of the gall-bladder 70 to 80 per cent of the cases showed anacidity and achylia gastrica. In a series of 39 cases of this type 71 per cent showed lack of free HCl, 17 per cent showed free HCl below twenty, and 12 per cent normal HCl. In another series of 45 cases in which stone-occlusion of the cystic duct or strong shrinkage of the gall-bladder was found, 84 per cent showed no free HCl, 14 per cent were subnormal and 2 per cent normal. In 16 cholecystitis cases without cystic occlusion, 13 showed anacidity and the other 3 subacidity. His dog experiments corroborated these findings. The author reasons that a condition which brings about the loss of function of the gall-bladder disturbs the secretion of HCl with more or less disastrous results to the patient.

Rust demonstrated on dogs that in those cases in which the bile-ducts had become continent the muscle fibers of the papilla vateri were well developed, and of those cases in which the bile-ducts were not continent this muscle was very poorly developed. It is very probable then that in those patients in which no stomach disarrangement appears the bile-ducts have become continent and are preventing thereby the constant dripping of bile into the duodenum with its associated chronic irritation. Where HCl is found in the stomach, even though there is an occlusion of the cystic duct, it is fair to assume that the gall-bladder is still functioning sufficiently to carry on the normal cycle, and in those cases where there is a hyperacidity present the gall-bladders are possibly in a state of hyperirritability, and therefore producing too much hormone.

The author concludes that in that class of cases in which lack of free HCl is found in the stomach and no occult blood in the stool, the gall-bladder is irreparably diseased and should be removed. In cases of cholecystitis and gall-stones with a normal amount of HCl in the stomach contents, the indications are that the gall-bladder is still functioning and that drainage would be preferable.

The author urges conservation of the gall-bladder where possible in order to maintain the normal secretion of HCl, secretin and the other digestive juices. LESTER H. HILLS.

Willis, A. M.: The Advantage of Cholecystectomy in the Avoidance of Adhesions in Gall-Bladder Surgery. *Ann. Surg.*, Phila., 1917, lxvi, 411.

The author reports a series of experiments performed upon dogs which tends to show that bile may stimulate adhesions if it comes in contact with tissues not surrounded by epithelium. In his first series cholecystectomy was performed without spilling the bile into the abdominal cavity. Only one dog showed adhesions and these were insignificant.

In the second series cholecystectomy was done, but the contents of the gall-bladder were emptied into the abdominal cavity. At the end of twenty-eight days one dog showed no adhesions, but the others showed moderate or numerous adhesions. Cholecystotomy with drainage was done in the next series and in each case numerous adhesions resulted.

In the fourth series after doing a cholecystectomy, the gall-bladder area was smeared with bile infected with bacillus typhosus. Many adhesions were the result. In the fifth series, bacillus coli was used in place of the typhoid bacillus. In series four and five the number of adhesions was greater than in the preceding experiments where normal bile was used.

It is the judgment of the author that the gall-bladder should not be explored by incision, but in uncertain cases it is better to do a cholecystectomy without drainage, as it is of the utmost importance that the irritating and frequently infected bile should not be allowed to come in contact with the peritoneum. GATEWOOD.

Benham, F. R.: Indications for Cholecystectomy and Cholecystotomy. *Ann. Surg.*, Phila., 1917, lxvi, 464.

Attention is directed to the fact that gall-stone colic may be a persistent symptom even where no gall-stones can be found. Benham believes that cholelithiasis should be operated upon as soon as the diagnosis is made. Many cases of so-called recurrence are due to overlooked stones. A diseased appendix if allowed to remain will continue to distribute infection to the gall-bladder contents after simple drainage of the gall-bladder.

The present technique followed by most surgeons is incision through a median high line to the ensiform cartilage so that the liver can be rolled out and the gall-bladder used as a tractor. Every case, according to the author, must be a law to itself in relation to the drainage or removal of the gall-bladder.

The author believes that cholecystectomy should be performed when the following conditions are

present: (1) when stones occupy the gall-bladder; (2) in the case of cholecystitis without stones; (3) when the wall of the gall-bladder is diseased; (4) when there are stones or any other obstructions in the cystic duct; (5) when there are adhesions around the gall-bladder which interfere with its pump-like action; (6) in the case of the strawberry or papillomatous gall-bladder; (7) in the case of malignancy.

Cholecystotomy should be used: (1) in cases of pancreatitis with jaundice; (2) in the very old and feeble cases or in those cases of poor physical conditions; (3) in those cases where the operation would be dangerous because of the inaccessibility of the gall-bladder. The appendix should be removed in every case in which there is the least suspicion that it is diseased. D. N. EISENDRATH.

Bullock, F. D., and Rohdenburg, G. L.: Splenectomy Exerts No Appreciable Influence Upon Immunity Against Transplanted Tumors. *J. Cancer Research*, 1917, ii, 465.

The authors report the results of further experiments in immunity to transplanted tumors. Their experiments were based on the assertions of Da Fano, Murphy, and others, that lymphocytes play an important part in the production and distribution of immunity and that the spleen as a lymphocyte-forming organ may take some part in the process.

The conclusions reached after observation on splenectomized animals are as follows:

Splenectomy has no effect upon the persistence of immunity induced by the receding rat sarcoma.

Splenectomy does not influence the fate of regressive tumors.

Splenectomized animals are no more resistant to immunizing agents than are normal animals.

Splenectomy neither increases the percentage of susceptibility nor favors the growth of spontaneous tumor grafts.

The removal of the spleen or testes has little or no effect upon the immunity induced in adult mice by embryo emulsion.

Record charts of the experiments are given, and references mentioned. L. R. GOLDSMITH.

Mayo, W. J.: The Relation of the Spleen to Certain Obscure Clinical Phenomena. *Med. Rec.*, 1917, xcii, 705.

The spleen may be enlarged to twice its size before the enlargement can be detected. Palpation gives the only definite information as to its size.

In 168 splenectomies in which there were various clinical manifestations, the pathological changes, both gross and microscopic, varied chiefly in degree.

In portal cirrhosis with enlargement of the spleen it is suggested that the source of the poisons may be the spleen. Removal of the spleen gives results which justify this belief.

The author has removed the spleen in 50 cases of pernicious anæmia. There is no definite relation between the size of the spleen and the seriousness of the disease, nor between the result of splenectomy and the size of the spleen removed. Temporary improvement occurred in every case. No patient has been cured, but in 75 per cent of cases the benefits obtained justified the operation.

In 19 cases of spenomyelogenous leukæmia splenectomy has been performed after first reducing the size of the spleen with radium. All but two were markedly relieved. There were no operative deaths.

In hæmolytic icterus splenectomy has been performed 19 times with remarkable results. The jaundice which may have been present for years practically disappears in four days. There was one operative death.

The author has removed the spleen four times for biliary cirrhosis with satisfactory results in three cases.

Splenic anæmia is cured by splenectomy in a high percentage of cases. In 43 splenectomies there have been four operative deaths.

In portal cirrhosis 5 splenectomies have been done with satisfactory results in four. One patient died following operation. H. J. VAN DEN BERG.

MISCELLANEOUS

Castellano, T.: The Importance of Left Axillary Adenopathy as a Diagnostic Sign of Abdominal Neoplasms (Importancia de la adenopatia axilar izquierda como signo diagnostico de los neoplasmas abdominales). *Rev. méd. d. Rosario*, 1917, vii, 333.

Clinical observation for some years has demonstrated to Castellano the relative frequency of neoplastic metastases in the left axillary ganglia in cases of tumors of the stomach, intestine and peritoneum. He quotes from the literature to show how far this has been observed by various authors. The symptom appears due to the fact that the thoracic canal through which propagation is effected runs into the left subclavicular region.

The author mentions 6 cases in which left axillary adenopathy enabled him to make a diagnosis of abdominal cancer. In all cases a subsequent operation or autopsy confirmed the diagnosis.

The symptom of left axillary adenopathy has not received the attention which it merits. The author thinks it should be a matter of custom systematically to examine the axillary as well as the supraclavicular and inguinal ganglia in all cases where an abdominal neoplasm is suspected.

W. A. BRENNAN.

Johnston, W. H.: An Unusual Complication of Laparotomy for Gunshot Wound. *Lancet*, Lond., 1917, cxciii, 533.

The case reported is that of a soldier, aged 26, who received a rifle wound in the abdomen. He was transferred to a casualty clearing station, where a laparotomy was done. Five perforations were closed in the small intestine and two tears in the mesentery. The patient had a mild peritonitis for

twenty-four hours, but convalescence was very satisfactory until the thirteenth day, when he was transferred to a base hospital.

At this time there was localized tenderness over the middle of the scar. The patient complained of slight pain; the abdomen was otherwise negative. Suddenly, on the same night, he was seized with acute abdominal pain, with frequent vomiting. Pulse was 120; temperature 100; there was general abdominal rigidity, considerable tympanites, great tenderness, but no dullness in the flanks. Early the next morning the patient exhibited all the signs of acute peritonitis.

The incision was opened and a large abscess cavity found on the posterior sheath of the rectus, which had opened through into the peritoneal cavity. The abdomen contained several pints of thin, greenish, purulent fluid. The organisms isolated were the staphylococcus pyogenes, the bacillus coli and a short-chained streptococcus.

The abdominal cavity was irrigated with Dakin's solution, and four drains of rubber tubing inserted. The wound was closed and the patient put in the Fowler position. Dakin's solution was used through tubes every three hours for the first two days, every four hours for the next four days and from then every six to eight hours, each time using 50 to 80 ccm.

The patient's temperature immediately became normal, and the pulse was normal on the third day. Owing to infection, all the stitches were removed by the third day. Some pockets of pus were found, but these were irrigated with Dakin's solution. Gradually the tubes were removed from the abdominal cavity, until all were removed by the eighteenth day. The patient made a good recovery and thirty-three days after the operation went to England.

The author suggests the further investigation of the use of Dakin's solution in the peritoneal cavity.

C. A. BOWERS.

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

Achille, F.: Infected Knee Wounds; Treatment and Results (Ferite infette del ginocchio; trattamento ed esiti). *Gazz. d. osp. e d. clin.*, Milano, 1917, xxxviii, 723.

Achille's experience in the military hospital of Ravenna, and his study of the results obtained by others as reported during the war, leads him to think:

1. That small transfossal wounds of the knee generally heal without intervention.

2. That it is not always advisable to extract small projectiles buried in the articular head without serious bony lesions, as the operative act can awaken infective processes of extreme gravity. Careful immobilization and watchfulness ought to be the surgical aim in these cases.

3. In recent lacero-contused articular wounds, early intervention, the use of non-caustic fluids and the promotion of proteolysis by hypochlorites is the procedure of choice.

4. When an infective process is evident, the existence of a fracture of the articular head will be assured by radiographic examination, as well as the presence of any foreign body. Simple arthrotomy is always insufficient to dominate an infection. In such cases, if the condition of the patient permits, an atypical resection should be attempted, using the low curved Mackenzie incision; this should be completed by the excision of all the synovial and by removal of the patella.

5. In cases of infective arthritis not complicated by osseous lesions, when a wide aggressive arthrotomy and immobilization do not suffice to arrest the infective process and there is a threat of sepsis, there should be a recurrence to the occlusive plaster apparatus, according to the procedure suggested by Ruggi. This is kept in place from 15 to 20 days. In this way a limb otherwise doomed will often be preserved.

6. Amputation of the thigh ought to be reserved for extreme cases or those in which the complication of an ascending infective osteomyelitis renders any attempt at preservation vain.

The author's statistics cover 56 cases, 27 of which were strongly infected penetrating wounds, some complicated by fracture and retention of the projectile. Wide arthrotomy was practiced in all 27 cases, with removal of foreign bodies and arthrectomy or partial resection.

Of these 27 cases 14 healed without other intervention; 1 died from sepsis; 12 had secondary amputation of the thigh with 8 recoveries and 4 deaths.

There were 4 cases of pyoarthrosis with existence of fracture and osteitis of the articular head. All were treated by atypical resection, removal of the patella and synovial sac. Three were cured; one had secondary amputation of the thigh.

There were 2 cases of comminuted fracture of the articular head with acute sepsis due to grenade injury and in which amputation was not advisable; both died. The remainder of the 56 cases recovered.

W. A. BRENNAN.

Taylor, H. L., and Barrie, G.: Juxta-Articular Bone Lesions of the Hip. *J. Am. M. Ass.*, 1917, lxix, 1227.

Many affections of the hip formerly classified as tuberculosis are now recognized as distinct conditions, since the wider use of the X-ray. Conditions

such as coxa vara and slipped cartilage epiphysis are not difficult of diagnosis. More recently osteochondritis or Perthe's disease, a perfectly benign affection, has been studied and separated from tuberculosis of the hip. While studying Perthe's disease, cases are seen in which the symptoms are persistent lameness with little pain and stiffness, and which clinically cannot be differentiated from osteochondritis. But instead of a flat and irregular epiphysis, the X-ray shows a perfectly normal head and epiphysis with a spot of osteolysis in the neck or trochanteric region. This is due to a process known as hæmorrhagic osteomyelitis, which never results in pus formation. In another class of cases localized infectious foci with pus formation, so-called "bone abscesses," are found. This may be due to an invasion of pus-forming organisms, or to the re-awakening of an old osteomyelitis. Similar processes may occur about the acetabulum.

These two classes of cases are also seen at the knee, ankle, upper extremity, and are rarely multiple. The most common symptom is lameness; and when a child suffers from persistent lameness, a thorough clinical examination should be made with the use of the X-ray. The diagnosis is at once made by the appearance of a light spot on the plate. The spot at first is about the size of a nickel and as it progresses may leave only a cortex of egg-shell thinness. Occasionally these cases have been diagnosed as sarcoma. However, there is no sequestrum, no involucrum, no pus.

In the advancing cases evacuation of the focus with moderate curettage of the cavity, and in the larger cavities the introduction of autogenous bone chips give good results. Restitution of structure and function are practically perfect. Short periods of splinting and recumbency are effective in the milder cases without operation. The lesion and lameness may last for several years. In about 75 per cent of cases an initial history of trauma is obtained.

The treatment of bone abscess consists in opening the bone and curetting the abscess cavity, disinfecting it with tincture of iodine, draining and allowing the cavity to heal by granulation.

J. J. KURLANDER.

Achard, H. P.: Regional Anæsthesia of the Upper Limb (A propos de l'anesthésie regionale du membre supérieur). *Progrès méd.*, Par., 1917, p. 323.

The author refers to the methods of regional anæsthesia of the upper limb devised by Kulenkamff and modified by Santoni. He thinks these methods are blind, more or less dangerous, and do not always give a sure result.

Achard proposes a method which, although it has the disadvantage of occupying about thirty minutes in execution, yet is absolutely without danger and is sure. The technique is as follows:

1. The patient is put in the classic position for ligature of the subclavian artery.

2. Under local anæsthetic an incision from 1 to 2 cm. long is made along the upper edge of the clavicle. This will be outside the artery. After making the incision if the venous confluence is directly met it is pushed inward and upward in the manner opposite to that done in the operation for ligature of the subclavian.

3. The aponeurosis is incised; and immediately at the bottom of the incision the white cords of the brachial plexus are seen, reduced in this spot to three nerves only.

4. Five ccm. of five per cent novocaine are then dropped in the bottom of the wound; a few moments later an injection of one ccm. of two to four per cent novocaine is injected with a fine needle under each of the three nerve sheaths. A bath of ten ccm. of one-half per cent novocaine is given to the whole region and a suture of the aponeurosis and teguments is made by a couple of stitches in one row. Anæsthesia is certain because every nerve has been seen. There is no fear of any arterial lesion because operation is done quite openly.

As a general rule anæsthesia of the upper limb by this method is complete at the end of ten minutes and it is prolonged to one and one-fourth hours.

The author adds that it is essential that a concentrated solution, two to four per cent, be used in injecting the nerves because the more voluminous a nerve cord, the more necessary it is to have a concentrated solution in order to reach by osmotic tension not only the superficial fibers, but also the central fibers, and it is on account of the high contents of the liquid in an anæsthetic substance that only a small quantity is employed. W. A. BRENNAN.

Knaggs, R. L.: A Case of Osteo-Aneurism; Diffuse Traumatic Aneurism in the Surgical Neck of the Humerus. *Brit. J. Surg.*, 1917, v, 243.

The author reports an interesting case of traumatic aneurism, occurring in the interior of the humerus, the patient having been wounded in the left shoulder on September 15, 1915. He was first treated in a general hospital in France for thirteen days; he was then sent to England on October 2, where he was admitted to another hospital.

The bullet had passed through the surgical neck of the humerus; the wounds were healthy and apparently superficial when he was admitted. On the night of October 21, he suffered a great deal of pain in the shoulder and the next morning pulsation was first detected about an inch above the exit wound. The upper part of the shaft was considerably enlarged and this was the subject of expansile pulsation. The main artery could be felt to be normal. There was no thrill, and no bruit could be made out.

A roentgenogram was taken October 16; this showed a large irregular aperture in the surgical neck with commencement to the internal surface. Another roentgenogram taken October 31 confirmed the increased expansions of the bone and further enlargement of the space in the interior.

A diagnosis of rapidly growing endosteal sarcoma was made. On November 1 the interscapulothoracic

amputation, by Littlewood's method, was performed. Rapid recovery followed.

The tumor revealed, on macroscopic examination, a dark red membrane, a portion of the sac of traumatic aneurism. Further examination disclosed a portion of the original aneurismal sac in the highest part of the cavity.

Microscopic examination revealed no evidence of sarcoma, the walls of the cyst appearing to be constituted of organizing ossifying granulating tissue. E. C. ROBITSHEK.

Young, J. K.: Syphilis of the Joints. *Med. & Surg.*, 1917, i, 836.

Articular syphilis may manifest itself either in hereditary or in acquired forms. In hereditary syphilis, four different varieties may be enumerated: (1) simple serous synovitis, marked by excessive effusion and with little destruction of cartilage; (2) chronic synovitis with chronic hyperplastic degeneration of the synovial membrane; (3) osteochondritis, accompanied by chronic synovitis and necrosis of the epiphyses; (4) chronic arthritis, secondary to osteomyelitis, periosteitis, or osteitis of the shaft.

In the acquired forms, syphilitic arthritis may manifest itself in the secondary or in the tertiary stage. The articular lesion which occurs coincidently with the secondary symptoms is characterized by simple, serous synovitis, transient and evanescent in nature, and leaving but little trace of destruction. Tertiary syphilis of articulations is characterized by chronic hyperplastic synovitis, with or without formation of gummata, and followed by destructive changes in the cartilage in and about the joints. Finally, there are the lesions resulting from tabes dorsalis, the well-known Charcot's joint.

Because of the prominence of the associated lesions, the diagnosis of hereditary syphilis is not so difficult as that of the acquired form. The latter is most frequently confounded with tuberculous or suppurative arthritis. The association of syphilitic arthritis with other joint lesions complicates the diagnosis; this is especially true of tuberculosis and mixed infections, which may be engrafted upon the lesion, thus masking the true diagnosis. In adults the diagnosis will be simplified by the discovery of lesions in the diaphyses of the long bones due to ancient periosteitis, the thickened, striated appearance of the periosteum being almost pathognomonic of syphilis. The synovial fluid should be examined by diagnostic puncture.

The roentgen ray diagnosis of syphilitic arthritis is a study of consuming importance. The most characteristic lesion noted is thickening of the periosteum, due to successive layers of deposit at the diaphyseo-epiphyseal junction. Unlike the blurring of the negative seen in early tuberculosis, the outlines of the bones entering into the formation of the articulation are distinct. When characteristic osteitis is present, there is darkening of the shadow from sclerosis of the bone above the area of activity, with thinning at the seat of active inflammation. A destructive area is quite distinct, which never has the mottled, spotted, or grossly irregular appearance met with in malignancy.

Tuberculous chronic articular arthritis is characterized by the absence of fluctuation; the capsule is not thickened; the joint outline is distinct; there is limited motion, pain on movement, spasm and pronounced atrophy. In syphilitic arthritis there is slight effusion, the joint outline is clear, enlarged and indurated; there is some pain on motion, but no spasm, and slight atrophy.

The treatment of the different forms of syphilitic arthritis varies according to the type of the disease. The effect of mercurial preparations upon hereditary joint lesions is most beneficial and prompt. In the most common form, osteochondritis, after removing the necrotic tissue freely from the joint by surgical means, Young has seen pain disappear and healing begin almost immediately after the administration of mercurial preparations. The joint should then be supported by a plaster-of-Paris case and contractions carefully guarded against in the chronic forms by suitable orthopedic apparatus. In the later stages, massage, baking, and counterirritation by means of iodine are beneficial. In Charcot's lesion of joints spinal puncture should be made for both diagnostic and therapeutic purposes.

P. G. SKILLERN, JR.

Dickson, F. D.: Diagnosis and Treatment of Certain Subacute and Chronic Joint Conditions. *J. Missouri St. M. Ass.*, 1917, xiv, 421.

The author discusses: (1) static arthritis of the knee; (2) traumatic arthritis of the shoulder; (3) epiphysitis of the hip; (4) loose bodies in the knee-joint.

Static arthritis of the knee is usually caused by faulty weight-bearing due to knock-knee, pronated feet, or a combination of the two, and is treated by correcting the deformity.

Traumatic arthritis of the shoulder, including fractures in the neighborhood of the shoulder-joint, often follows injuries produced when the arm is in an abducted position resulting in a tear of the antero-inferior part of the capsule. These injuries are too frequently dressed in a position of adduction and internal rotation which allows contraction of that part of the capsule and results in limitation of motion and pressure on the brachial plexus producing a referred pain down the arm. Another causative factor is focal infection, which should be sought and eliminated.

Acute epiphysitis of the hip is by no means always due to tuberculosis. In this condition also infective foci play an important rôle.

Loose bodies in the knee-joint are often the result of osteochondritis dissecans. Differentiation should be made between this condition and dislocation of the semilunar cartilage; the roentgenogram shows a defect in the articular surface of the femur, generally on the outer side of the internal condyle. Trauma is the most probable cause. R. B. COFIELD.

Roberts, P. W.: The Etiology of Perthe's Disease. *J. Am. M. Ass.*, 1917, lxix, 19, 1598.

The author states that the etiology of osteochondritis of the hip, generally known as Perthe's disease, has been the subject of much speculation ever since the condition was recognized as a clinical entity several years ago. "Traumatism, obscure infection and perverted metabolism have each had their advocates. Tuberculosis has been eliminated because the joints recover with good function, and syphilis has been excluded because Wassermann reactions have been negative."

Notwithstanding the results of laboratory tests Roberts advances the opinion that this affection which occurs with considerable frequency in children is the result of inherited syphilis. In support of this view he states that:

1. A negative Wassermann is not reliable as infallible evidence of the absence of bone syphilis.
2. The pathologic findings described by Perthe coincide with one of the most common expressions of bone syphilis in children, namely, osteochondritis.
3. There are subjects with Perthe's disease who show dental evidence of inherited syphilis.
4. The course of osteochondritis of the hip is similar to that of many other syphilitic joint conditions in that the destructive process is self-limited and that there is a tendency to more or less complete restoration of function.

Roberts believes that the treatment of this condition on the hypothesis that it is of syphilitic origin is worthy of further investigation. In his experience all syphilitic bone and joint conditions improve more rapidly when the dose of potassium iodide is carried to the point of tolerance than when dependence is placed on a routine dose of moderate size. PHILIP LEWIN.

Haller: Fistulous Osteitis Consecutive to War Wounds (Des ostéites fistulisées suite de blessure par projectiles de guerre). *Presse méd.*, 1917, p. 581.

Haller draws attention to the seriousness of the fistulous complications which follow bone injuries in war. Surgical treatment alone is capable of promising recovery to the patient.

In investigating the signs and conditions of an osteitis Haller gives particular emphasis to the value of radiography. Every patient with a wound which will not cicatrize ought be examined radiographically at once. Aside from those cases in which the suppuration is due to a retained projectile, when there is an osteitic area radiography will show the modifications in the volume of bones as well as the structure of new bone, which shows quite differently from normal bone. In a fracture area radiography will show rarifying and condensed osteitis, osteitic cavities, subperiosteal callus, etc. The author thinks that radioscopy in such cases is useless. It is by radiography alone that the lesion must be read.

As regards treatment, it is difficult to lay down any general and precise rule to approach the osteitic area. If there are cases where approach to the bone ought be made through the fistulous tract, such as in a case of tibial osteitis fistulous at its antero-internal face, there are other cases which must be approached by a route other than the fistulous tract.

When the approach is through the fistula an elliptical incision is made around it and all cicatricial tissue excised. The soft parts are cut down to and including the periosteum by the bistoury. The periosteum is scraped away until the bone surface is exposed. When the fistulous tract is dangerous on account of the pressure of vascular pockets, another route must be selected, and this may necessitate reaching the osteitic cavity after breaking through much scar tissue. Whatever route is used, the osteitic area must be very widely exposed. The osteitic areas and cavities are then treated with the chisel and mallet, gouge and curette; the sequestra as shown in radiographs are sought and a thorough examination made of all corners and sinuosities of the cavity. Examination of the bone cavities must be complete and painstaking, because even a very small area of osteitis left may give rise later to the same sequellæ. If a cavity is prolonged by a tunnel or pocket in the bone, such must be opened up and all affected tissue removed. After thorough cleaning of the infected bone the author has employed according to the case either Mosetig's paste, or tamponade, or an immediate muscular plastic operation in order to compensate for the bone loss.

The postoperative care depends upon which one of the treatments for crowning the cavity has been adopted. The author thinks that a plastic operation is the ideal method because it is done at the same time as the cleansing of the infected area. The soft subcutaneous parts easily slide toward the cavity to be filled and create adhesions. The postoperative treatment in such cases is slight. Withdrawal of the sutures about the eighth day follows. If hæmostasis has been careful, there are no accidents; but if not, a hæmatoma may result. W. A. BRENNAN.

FRACTURES AND DISLOCATIONS

Ashhurst, A. P. C.: Screw Fixation in Joint Fractures. *Med. & Surg.*, 1917, i, 812.

The author believes that accurate reduction of the fragments in a fracture near to or involving a joint as a rule may be secured by bloodless manipulation. It is more important to secure anatomical reposition in such fractures than in fractures of the shafts of long bones; but it is also easier.

In joint fractures failure of accurate reduction entails not only deformity but also marked limitation of motion; yet fortunately as one fragment is very short, its position usually may be controlled by the position in which the neighboring joint is dressed. For example, in supracondylar fractures of the humerus, hyperflexion of the elbow secures anatomical reposition of the lower fragment in contact with the diaphysis. There are those cases, however, in which bloodless manipulation will prove

unsuccessful even after several attempts under anæsthesia. In such cases reduction should be secured by open operation and it is usually advisable to fix the fragments in proper position by buried prosthesis.

The author discusses the various means of accomplishing this end by plates, nail fixation, ordinary wood screws, ivory or decalcified bone pegs, autogenous bone pegs, autotransplants. He believes the best method is that of Lambotte's screw fixation.

It is necessary merely to reduce the fracture, to clamp the fragments securely with the bone forceps, to insert the self-boring screw or screws, to remove the forceps and close the soft parts. Once the fragments are reduced, the first screw inserted holds them in position. There is no possibility that after a hole is drilled for the screw or the peg, the fragments may slip and fall out of alignment.

"The self-boring screws have flat heads, of such shape that they fit into a special holder which is adjustable to any ordinary brace. The screw point is then placed against the bone, the drill rotated until the screw is firmly fixed in the bone, the brace with attached holder is then removed from the screw, which is finally screwed all the way home by an ordinary screw-driver. In most cases it is well to employ two screws in order to prevent rotation of one fragment on the other; and the screws should not be placed parallel to each other; even at a slight angle one screw binds the other, and makes separation of the fragments almost impossible. It is not necessary to countersink the screw heads further than is done by screwing them down upon the cortex as tight as possible; usually the periosteum or joint ligaments rise to a level with the screw heads."

The screws should not be placed in a subcutaneous position exposed to trauma, as for instance directly over the epicondyle or epitrochlea at the elbow or over the subcutaneous surface of the external malleolus.

Ashhurst has used these screws in 26 patients and has never had to remove any of them on account of irritation. PHILIP LEWIN.

Campiche, P. S.: The Late Correction of Malunited Fractures of the Extremities. *Calif. St. J. Med.*, 1917, xv, 420.

The author believes that many fractures carefully treated by the ordinary methods result in malunion and in impaired function, and necessitate some surgical intervention. The interval elapsing between the accident and the decision to submit to final operative correction is often much too great and may keep the patient for several months in an unnecessary condition of total disability.

The secondary correction of malunited fractures yields good results and should be resorted to as promptly as possible. In cases with a bad result, instead of a long interruption in treatment, the necessary correction should be recommended at an early date.

If these cases are recognized early, handled with decision, and submitted promptly to operative intervention, much improvement will result.

In this field there are many available procedures and interventions, such as removal of interposed muscles and fascias, freeing of compressed nerves, osteotomies, bone-graft operations, occasional wiring, and resection or arthroplasty. Conditions may often be so improved as to give the patient a useful limb.

PHILIP LEWIN.

Walker, S.: Position and Traction in the Treatment of Fractures. *Internat. J. Surg.*, 1917, xxx, 319.

The author attempts to demonstrate: (1) that all fractures should be treated with extreme gentleness; (2) that the mere fracture of a bone is not the only injury done and not the only portion of the injured member to be treated; (3) that X-ray examinations are essential and should be done early and often; (4) that the position of the injured member based upon the new mechanics produced by the fracture and the prevention of deformity by the muscles is the best splint known; (5) that the classical position of the ends of the broken bone is not always seen at first. These are the positions that the new mechanics will produce.

E. C. ROBITSHEK.

Picot, G.: Thirty Cases of Complicated Fractures Primarily Sutured (Trente observations de fractures compliquées suturées primitivement). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 1859.

Picot reports a series of thirty war fractures treated by surgical cleansing and primary closure. These include: 2 femur fractures; 12 leg fractures; 9 humerus fractures; 7 fore-arm fractures.

In his technique Picot makes very long incisions and large excision of muscles. The treatment is in no way sparing of the bone tissues. The bone surfaces are most minutely dealt with. The fractured surfaces and the medullary cavity are carefully and deeply curetted. If there are long fissures they are cleared and scraped on both faces. Every loose fragment of bone that is not removed is carefully rubbed with a compress soaked in ether. This is repeated several times.

The technique is long, difficult, and minute, but it is indispensable. Picot says that the toilet of the fracture must be made systematically, fragment by fragment, and every loose hanging piece of bone when left must be treated like the principal fragments. Closure of the wound is by superimposed planes, muscles, and skin. Bacteriologic control follows, the first test being made six hours after operation. When infection demands it, the wound is immediately re-opened.

The 30 cases gave 83 per cent perfect recoveries, 10 fistulæ, and 2 failures.

Picot's technique has been adopted by several colleagues. Of 67 fractures, 35 were treated in this way and sutured primarily, giving 29 perfect recoveries, or 82 per cent.

Picot was able to execute primary suture in 88 per cent of the cases received by him and his rate of recovery is 80.3 per cent. His colleagues practiced primary suture in 50.9 per cent of cases of fracture received and obtained success in 82 per cent. The factors counting for success are early intervention and satisfactory transport with immobilization of the fracture. W. A. BRENNAN.

Ridlon, J.: Congenital Dislocation of the Hip. *Surg. Clin. Chicago*, 1917, i, 271.

Ridlon states that most cases of congenital dislocation of the hip are in girls, and that in the majority of unilateral dislocations the left hip is affected. The time to replace the hip is determined primarily not by the age of the child but by the extent of shortening and the muscular development.

When the shortening is less than an inch the replaced hip almost invariably slips out again because the structural shortening of the muscles is not enough to hold it securely in the socket. On the other hand, one and three-quarters inches shortening in a child of good muscular development 8 or 9 years old is difficult to replace, although two inches may not be difficult in a child of three or four years of age.

The bloodless replacement usually called the "Lorenz operation" consists in a stretching of the capsule by extreme movements and manipulations in all directions and then a stretching of the limb by excessive traction. The adductor muscles are torn across subcutaneously by hacking with the edge of the hand. The abducted femur is then pried over the edge of a wedge block under the buttock until the femural head passes into the socket. The author followed this method only to discard it.

Ridlon's method is as follows: The patient's flexed knee is grasped and the thigh fully flexed on the body. The operator finds the greater trochanter, neck and head of the femur with the fingers of his other hand and places the thumb of that hand in front below the anterosuperior spine of the ilium. The femoral head is then pushed downward to a position opposite the lower part of the rim of the socket. The thigh is abducted, while the opposite side of the pelvis is held firmly down by an assistant, and the head can be felt by the operator's fingers and thumb passing forward and into the socket.

When the limb has been placed in the most secure right-angled abduction position, the stockinette and sheet wadding are applied. With the patient's body resting on a sacral and back rest, plaster bandages are applied to make the permanent plaster cast. It is necessary to extend the plaster down on the leg with the knee bent at right angles to prevent the thigh from rotating.

When considering prognosis, the author divides hip cases into three classes: (1) those that are displaced backward and upward; of these 80 per cent give perfect results; (2) those displaced directly backward, among which 60 to 70 per cent give perfect results; (3) those displaced forward and upward; about 50 per cent of this class give perfect results. The bilateral cases are classed by themselves and do not give perfect results in more than half the cases. Frequently but one cast is applied which remains for eight months. In older cases the first cast is removed at the end of four months, and after the legs are brought nearer together a new cast is put on; sometimes a third is applied.

When the cast has finally been removed, the mother or nurse makes a gentle inward rotation and stretching downward of the legs until after daily efforts the limbs are brought together and the toes point directly forward. P. H. KREUSCHER.

Fowler, R. H.: Dorsal Dislocation of the Great Toe at the Interphalangeal Joint. *Med. Times*, 1917, xlv, 283.

The author states that there are few cases of interphalangeal joint dislocations of the foot on record. The majority have been noted in the great toe. As compared with dislocations at the metatarsophalangeal joint, which is a common injury, this particular dislocation is very rare.

Fowler reports a case. An 18 year old boy injured the great toe while playing football. Pain, deformity and disability resulted. Examination with the roentgenogram revealed incomplete dislocation with backward displacement of the distal phalanx. Efforts at reduction failed. Under gas anæsthesia forcible correction failed, and an incision was made over the joint and the contracted tendon of the extensor proprius hallucis was divided. Reduction was easily and successfully obtained. PHILIP LEWIN.

SURGERY OF THE BONES, JOINTS, ETC.

Chaput, H.: The Prevention of Ankylosis after Elbow Resection by Immediate Mobilization (Traitement preventif des ankyloses survenant après les résections du coude, par la mobilization immediate). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 1708.

Chaput gives short clinical histories of four cases in which he made an immediate mobilization after resection of the elbow for fracture.

The cases tend to demonstrate:

1. That immediate mobilization not only is not dangerous but that it is indispensable to avoid postoperative ankylosis.

2. That muscle and fat tissue interposition is useless.

3. That immediate mobilization is contraindicated when there is articular infection.

W. A. BRENNAN.

Alquier, P., and Tanton, J.: Traumatic Resection of the Hip for War Wounds (La reséction traumatique de la hanche pour blessures de guerre). *J. de chir.*, Par., 1917, xiv, 113.

The authors have successfully practiced resection of the hip in 12 cases of war injuries. The results

have been followed up in most cases for a period varying from eight to twelve months. The procedure is new; nothing in the way of a conclusion can be drawn from the fact that in all 12 cases of hip resection there was a recovery. The operation is not benign, and a good deal depends on a concomitance of other lesions with those of the hip.

Resections of the hip may be classified similarly to the division adopted for fractures of the femur, and distinguished as: (a) subcapitular resections; (b) transcervical resections; (c) basicervical resections; (d) transtrochanteric resections; (e) subtrochanteric resections.

In the authors' cases there were 2 each of (b), (c) and (d), and 6 of (e). The portion of bone resected varied from about sixteen to twenty cm. One of the resections was primary and executed fifteen hours after injury; 10 were secondary; and 1 was late, three months after the injury.

The anatomic indications for resection are of three kinds, viz.: intra-articular lesions, juxta- and intra-articular lesions, and juxta-articular lesions. But another factor may arise, i.e., infection which modifies the entire evolution. The mode of treatment depends on the anatomic lesions, infection or otherwise, and on the preservation of function.

Recently Leriche declared that when a fracture was epiphyseodiaphyseal, and the upper femoral third reduced to splinters, immediate disarticulation was indicated as the only chance of safety. Delorme also expresses the opinion that resection should not in any case be made beneath the bitrochanteric line, as the results are deplorable. The authors do not share these opinions and they think that even in such cases as stated, when there is integrity of the large vessels and nerve-trunks, resection of the hip is capable of giving excellent results.

In intra-articular fractures with coxofemoral suppurative arthritis concomitant, the indication for early resection is even more pressing than in non-infected fractures. Arthrotomy in such cases is always insufficient. In extra-articular lesions likewise resection is indicated. It should be as extensive as necessary, but the important point is that the resection should be complete and total. It is only on condition that a disinfected surgical operation is immediate and complete that an aseptic evolution of a comminutive fracture can be expected.

The authors discuss the value of resection as a means of preserving the function, which is the main objective of the surgeon after the preservation of the patient's life. To consider primary complete resection as the only means in all cases to save the life and the limb would be beyond the truth. The indications for primary resection are limited to the orthopedic indications. When primary disinfection of the fractured area fails, then there is an indication for secondary resection, which, if done in the best period, will assure the best functional results. In some of the authors' cases resection was not done until after the twentieth day. The authors think that an early intervention should be made to assure drainage and disinfection of the area in all cases. If the lesions are such that the functional prognosis of a primary resection is not promising, then the intervention should be confined to a clearing operation, letting the case evolve until the optimal period when a secondary resection should be done if indicated.

The authors describe the operative technique of resection, both for intra-articular hip fractures and extra-articular fractures. In 8 of their cases of trans- and subtrochanteric resections they employed: in 1 case Ollier's incision; in 5 cases an external and posterior bent incision; in 2 cases a purely external incision approximating the incision of Ollier and of White. They emphasize that by a simple external vertical incision traced on the external face of the trochanter and of the diaphysis about two finger-widths above the summit of the great trochanter, it is easy to make a subperiosteal resection of all the superior extremity of the femur and to descend as far as necessary on the diaphysis.

The immediate postoperative treatment is immobilization and abduction. Immobilization is made by a plaster cast reaching from the base of the thorax to the toes. Its duration in cases of subtrochanteric resection varies from two and one-half to five months. With regard to position, the limb should be placed in about 35 degrees of abduction and in slight external rotation. This abduction must be maintained for a long time.

The later orthopedic treatment after removal of the plaster cast consists in application of a celluloid corset fashioned to the shape of the pelvis, hip and thigh, and supported by a Reclus stirrup, which is illustrated. The patient is permitted to get about with the aid of crutches. The celluloid corset ought to be worn from twelve to eighteen months or even longer to avoid secondary deviation of the limb.

The results obtained by the authors in their 12 resected cases included: 1 loose fibrous pseudarthrosis; 1 ankylosis; 6 solid pseudarthroses with restricted mobility; 4 operations still too recent to pronounce definite results. The 8 trans- or subtrochanteric resections gave: 4 solid pseudarthroses with restricted mobility; 1 loose pseudarthrosis; 3 results still too recent to report definitely.

The authors conclude that if they are subcapsuloperiosteal and are made secondarily in the optimal period, extensive epiphyseodiaphyseal resections of the hip can give very good results.

W. A. BRENNAN.

Mosti, R.: Arthrotomy of the Knee in War Surgery, with Special Reference to a New Method (Sull artrotomia del ginocchio in chirurgie di guerra con speciale riguardo ad un muovo metodo personale). *Policlin.*, Roma, 1917, xxiv, *sez. chir.*, 458.

Mosti thinks that the transpatellar method devised by Bougot and De la Rue is the most rational method of executing arthrotomy of the knee-joint in war surgery. In this the incision is vertical and

median on the anterior face of the knee, starting from the lower extremity of the patella across its anterior face and rising above it for about four or five finger-widths to the point where it meets the subquadricipital cul-de-sac. But the method is too mutilating owing to the fact that the cutaneopatellar strip, left free until complete recovery, undergoes a very marked retraction and not only leaves a large deforming scar of the knee but also a very notable functional defect, i.e., the abolition of movements of extension. There is interrupted continuity of the patellar tendon.

For the purpose of avoiding these undesirable results Mosti applies a continuous extension to the cutaneopatellar strip, using a simple procedure: On the cutaneous face he fixes two wide strips of adhesive plaster. The two free ends brought together are fastened to an elastic tube. The tube is fixed to the end of a metallic stirrup fixed in the part of the immobilizing plaster cast which corresponds to the plantar part of the foot. The tube is kept in slight tension. The cutaneous strip thus acquires a strongly oblique position and the articular cavity is kept gaping so that the Carrel method can be applied. When a relative sterilization of the articular cavity has been reached, the tendon stumps are united with catgut by a tenorrhaphy and the cutaneous margins sutured without drainage. This is easily done as the strips have preserved their full length owing to the traction exerted on them. In general the secondary suture can be attempted from the tenth to the fifteenth day.

Mosti has adopted this method for some time past in the majority of knee wounds with the best results; he reports some typical cases. He claims that the transpatellar arthrotomy with the modifications made by him is applicable to every type of knee wound, no matter how much time has elapsed since the injury. It also fulfills other conditions which cannot be satisfied by other methods. He sums up the advantages as follows:

1. It widely exposes the greater part of the articulation, thus giving means for better drainage.

2. It enables a wide exploration of the articular cavity to be made, and by bringing eventual lesions into full display, facilitates the operative manipulation.

3. Elastic traction applied to the cutaneopatellar strip, while keeping it in a strongly inclined position, hinders its retraction, whatever may be the duration of the treatment.

4. Secondary suture both of the patellar tendon and of the cutaneous incision, made possible by the prevention of retraction, allows an almost complete restoration or a solid ankylosis in the best position. It obviates the large and deforming scars which generally result from other methods.

5. It is almost always possible in this method to conquer sepsis in the shortest possible time, and secondary resection very rarely becomes necessary, if it is not altogether eliminated.

W. A. Brennan.

Osgood, R. B., and Bull, E. C.: Operative Treatment of Tuberculosis of the Knee-Joint in Adults. *J. Am. M. Ass.*, 1917, lxix, 1162.

In children the centres of growth are in direct anatomic relation to the joint, and disturbance of these centers by disease or operation may seriously affect the length of the limb. There is also a more marked resistance to the disease, and cures with only slight disturbance of function frequently occur when persistent and continuous fixation is combined with general treatment.

In adults the disease once established never fully recovers, in the authors' experience, without operative interference of some form. The diagnosis of knee-joint tuberculosis cannot be made with certainty in the acute stage. Several other monarticular affections may be mistaken for it: a subacute gonorrhœal infection; syphilis; villous arthritis; simple chronic arthritis; or a traumatic arthritis.

The authors are convinced that the disease is at times primary in the synovia. They find the von Pirquet test to be of only negative aid in excluding tuberculosis. The subcutaneous test is of great value; a rise in temperature, increase of the local joint symptoms such as added heat, tenderness, etc., is almost conclusive evidence of the presence of the disease. The X-ray findings are negative when the disease is in the articular cartilage. Tuberculosis is a destructive process and when the bone is affected, loss of substance will often be shown. There are often lime salt deposits beneath the periosteum; typically there is a hazy appearance of the articular surface. The Wassermann and complement fixation tests are done as a routine.

The authors' practice is to operate as soon as the diagnosis is made. Operation is deferred for about a month, during which time the knee is put at complete rest with no weight-bearing. In this way the acuteness of the disease subsides. Only two types of operation are considered. When the disease is thought to be in the synovia, an exploratory arthrotomy through a three-inch lateral incision is done, and if no bony disease is found, the joint is injected with from one to four ounces of a 4 per cent iodoform-olive-oil solution. A second or third injection may be necessary. If the bone is diseased, excision of the joint is the procedure of choice.

Some method of fixation of the bone-ends aids in early union. Fixation is accomplished by the use of steel plates or kangaroo tendons. The plates must occasionally be removed. In those patients of sedentary occupations, 45 degrees of permanent flexion is given, while in those of a chiefly ambulatory occupation, from 15 to 20 degrees of flexion is allowed. A plaster cast is applied extending from the toes to the groin. Firm callus is usually present in from four to eight weeks, and weight-bearing with artificial support is commenced at three months.

The operation is not generally contra-indicated in the presence of visceral disease elsewhere, and after excision, such lesions in many instances improve greatly. J. J. Kurlander.

Galloway, H. P. H.: The Patellar Bone-Graft in Excision of the Knee. *Am. J. Orthop. Surg.*, 1917, xv, 704.

The author believes that excision of the knee is one of the most useful operations in surgery and that properly performed in suitable cases, it is practically free from risk and will uniformly yield results gratifying to the patient and creditable to the operator. His experience with the operation covers not less than 50 cases and in only one of these has he observed a degree of shock sufficient to cause the least anxiety. His technique is as follows: "The ordinary U-shaped incision from condyle to condyle, across the patellar tendon, is employed, this incision commencing and ending well backward slightly above the level of the condyle. The first incision is deep and clean and is rapidly deepened further so as to open the joint widely and permit the flap, including the patella, to be seized with the gloved hands and stripped upward so as to completely expose the upper cul-de-sac, the knee being forcibly flexed to facilitate this step of the operation."

The semilunar cartilages together with any easily accessible and grossly tubercular masses of soft tissue are then quickly cut away, but no attempt is made to carefully dissect out all suspicious tissue, since this is unnecessary. With a chisel, a thin flap of bone is then raised from the side of each condyle and turned upward, being kept out of the way, if necessary, by a temporary suture or two. Corresponding raw surfaces are created on each side of the head of the tibia, but in the case of this bone the bony flap is immediately cut away. The lower end of the femur and upper end of the tibia are then sawed off in such a plane that when brought together the bones will fit with accurately apposed plane surfaces when the leg is flexed about fifteen degrees in relation to the thigh, the direction of the saw cut being further planned so as to secure apposition without any greater lateral deviation of the leg than is present in the sound limb.

"Only a thin slice of bone should be taken at first, so that the plane of the cut can be altered by the removal of further thin slices should it be found necessary to do this in order to secure an ideal relation of the leg to the thigh. While an assistant steadies the upturned patella by seizing with a lion-jaw forceps the soft tissues in which it is embedded, the surgeon next removes the posterior half of the patella with the saw, and a corresponding flat surface is created with the same instrument on the front of the femur and tibia. After bringing the knee into the extended position and accurately fitting the bones together, a small incision is made through the skin on each side of the tibial head, about an inch and a half below the free margin of the bone, through which are driven two five-inch wire nails in such a direction as to cross each other and nail the bones securely together. The patella is then placed on the bed prepared for it and nailed across the front of the joint, its upper half in contact with the femur and its lower half in contact with the tibia, thus forming a solid bony bridge across both bones. The flaps of bone raised from the femur are then brought into contact with the raw lateral surfaces on the head of the tibia. With a running suture of catgut, the deeper soft tissues are quickly brought together, the redundant tissues about the center of the flap being removed if found advisable. Interrupted sutures of silkworm gut complete the closure of the wound, except about one inch at the upper and posterior extremity on each side, which is left open for drainage. No vessels are tied throughout the operation and the Esmarch is not removed until a heavy dressing has been bandaged in place.

"It is most essential that the limb be carefully and firmly held, while the dressings are being applied, by an intelligent and experienced assistant who can move and handle the limb as necessary without exerting any strain on the joint, as the hold of the nails in the cancellous bone is rather precarious, and any carelessness may result in their being more or less loosened. Plaster is applied to the leg and thigh separately, these two parts of the lower extremity being then connected by three iron brackets which span the region of the joint and permit subsequent dressing if required. Further support of the joint, in addition to that supplied by the brackets, may be obtained by a firm cotton bandage applied from bar to bar of the lateral brackets as illustrated. Free oozing, sufficient to soak the posterior and lateral parts of the dressings, usually occurs, but is disregarded, and only exceptionally is the wound examined until three weeks have elapsed, at the end of which time the stitches and nails are removed; the large nails can usually be withdrawn with the fingers, but those fastening the patella in place ordinarily require removal with pliers. After sponging the line of the wound and the nail holes with a solution of biniodide of mercury in alcohol, clean dressings are applied and a fresh plaster dressing without brackets is put on from the top of the thigh to the toes."

At the end of four months, and often earlier, consolidation is usually complete and all protection is discarded.

PHILIP LEWIN.

Campbell, W. C.: Infraction of the Head of the Second and Third Metatarsal Bones; Report of Cases. *Am. J. Orthop. Surg.*, 1917, xv, 721.

The author states that the mechanical arrangement of the heads of the metatarsal bones renders them susceptible to severe injury from slight trauma, especially in the young who indulge in athletic games. Sudden jumping on the ball of the foot with the toes dorsiflexed and the heads of the metatarsals thrown downward causes this injury. Because the head of the second metatarsal bone is more prominent than any of the small toes, it is most frequently affected. In fact, this injury has not been observed in any of the other toes until recently. One case under the author's personal care suggests the possibility of the same lesion of the head of the third.

This lesion was reported first as a clinical entity in the August, 1914, issue of SURGERY, GYNECOLOGY AND OBSTETRICS, by Freiberg, of Cincinnati, who reported six cases, clearly defining the condition and its pathology.

The main symptom is severe pain in the metatarsophalangeal joint of the second toe, especially after walking. The head of the second metatarsal is distinctly thickened, very tender, and painful to all motion of the joint. The roentgenogram reveals a flattening of the head with laterally placed osteophytes. These may become detached as free bodies in the joint. Such a picture may be easily mistaken for some other non-traumatic process. Careful investigation usually reveals that the symptoms date back to stubbing the foot, as in basketball, tennis, running up steps, etc.

The condition may be relieved by felt pads, posteriorly placed, followed by steel bars in the shoe to limit motion of the joint. When such measures are not effective, removal of the free bodies often gives an excellent result.

Campbell reports 5 cases, 3 in detail. Of 11 cases reported, including Freiberg's 6, 9 were in girls about the age of puberty and 2 in middle-aged women. No case has been observed in males. The condition must be more frequently seen, but undoubtedly is the cause of quite a number of anterior arch disturbances probably hitherto not perfectly understood. PHILIP LEWIN.

Lance: Equinism Consecutive to War Wounds (Sur l'equinisme consécutif aux plaies de guerre). *Presse méd.*, 1917, p. 635.

The author comments on the great frequency of varying degrees of equinism following war fractures. There is equinism whenever the angle of flexion between the foot and the leg is reduced. This angle normally exceeds a right angle by from 20° to 25°. Hence it is an error to think that there is no equinism if the foot can flex at a right angle to the limb. Equinism will not occur, according to the author, if suitable prophylactic measures are rigorously insisted on.

Such measures may be outlined as follows: (1) every patient with a wound of the calf of the leg or of the Achilles tendon should have the foot maintained in good position in a splint. When the foot can easily flex, the splint may be dispensed with and a special method of bandaging applied which the author describes and illustrates; (2) every patient with contracture should be subjected as soon as possible to systematic mobilization, both active and passive, of the foot; (3) the splint employed should be one which bends the foot at 80° to the leg; (4) crutches and canes must be rigorously dispensed with; (5) patients with cicatrized wounds should only be permitted to walk when with the knee flat the foot can be flexed at 80° without pain, and when the patient can crouch and flex the foot completely, the heel not leaving the ground.

The author's experience has convinced him of the absolute uselessness of physiotherapy and mechanotherapy in the treatment of confirmed equinism. Vigorous orthopedic measures, extension apparatus, and plaster casts must be applied.

The author has observed more than 100 cases of equinism treated by tenotomy. The results were often very defective. In subcutaneous tenotomy the tendinous sheath if forced open cannot be reclosed. The skin invaginates between the two tendon stumps and adheres to their cicatrix. The result is very painful walking. Even if a high tenotomy according to Jalaguier's technique is done, the intratendinous cicatrix is not always solid and may rupture; this happened in some cases treated by the author. The inconveniences may be avoided by adopting the method of tenotomy by which there is a double transverse bisection, the two horizontal incisions being united by a longitudinal median incision.

The author has treated more than 200 cases of developing equinism. By the vigorous application of these prophylactic measures it has not been necessary to evacuate a single case for mechanotherapy nor to perform one tenotomy for equinism. W. A. BRENNAN.

Groves, E. W. H.: The Methods and Results of Transplantation of Bone in the Repair of Defects Caused by Injury or Disease. *Brit. J. Surg.*, 1917, v, 185.

The transplantation of bone, depending as it does upon the fundamental facts of bone structure and growth, has been the subject of much experimental and clinical work.

Divergent views are held by leading workers. Havers, in 1692, gave the first accurate account of osseous structure, and he described periosteum as a connective-tissue, limiting and vascularizing membrane.

Ollier's work in 1867 was so thorough and so careful that his conclusions have attained an almost unassailable position. Unfortunately, that part of his work which related to the apparent osteogenetic function of the periosteum has taken so firm a hold upon surgical teaching that the remainder has been overlooked or forgotten.

Axhausen in 1898 was dominated by the idea, then universally held, that the periosteum was the principal agent in osteogenesis.

In 1911 Macewen denied that the periosteum was anything but a limiting membrane and he ascribed to the osteoblasts all the phenomena of bone growth and repair.

Axhausen has without doubt shown that after bone grafting the chief osteogenesis in the graft occurs beneath the periosteum. But it might equally as well be stated that the new bone is formed under the superficial surface of the old bone as that it arises from the deep surface of the periosteum.

It contains two well-marked stages, i.e., the early cartilage and the late bone; the former is converted into the latter. But the bone callus is next to the

bone, while the cartilage callus is next to the periosteum, showing that the site of origin of the whole was from the bone, and that it was formed from within outward, and not in the reverse direction.

The periosteum is chiefly a limiting membrane of the bone. The dense bone can live, grow, undergo repair, and produce fresh periosteum after the latter has been removed. In young bones it is possible to remove the periosteum in such a way as to produce an osteogenetic membrane, this being probably due to the lifting of the epiosteum with the periosteum. In adult bones this is impossible, except after trauma or inflammation. Nevertheless, the retention of the periosteum, though not necessary, is highly desirable in grafting, because its presence affords a ready means whereby the graft may become vascularized.

The endosteum has precisely the same capacity for osteogenesis as the epiosteum, though in a lesser degree. Compact bone, if it has a proper blood supply, is quite independent of either periosteum or endosteum for both growth and repair. If deprived of its blood supply temporarily as in a graft, it acts in a very indolent manner, and the greater part of its cells die, but those on all the free surfaces epiosteal, endosteal, and cut edges survive and proliferate to form new bone. The tissue becomes vascularized, and in the new haversian canals new bone is deposited. Fragmentation of a graft may secure the survival of a greater number of osteoblasts, but it does not ultimately produce a larger bone.

Four American papers represent recent work suggested by Macewen's book and deal with experiments done on the same lines. Davis and Hunnicutt confirmed Macewen's experiments, and showed that periosteum, either as a flap or as a free graft, did not produce bone, but if a thin layer of bone was raised with this membrane, osteogenesis occurred. Brown and Brown also obtained results similar to Macewen. They added the important observation that living bone transplanted into soft tissue only survives for a short period, but ultimately undergoes absorption. Phemister's experiments demonstrated:

1. Actual osteogenesis occurs in the graft.
2. Osteogenesis occurs in a graft deprived of its periosteum and endosteum, but much more scanty than that occurring in whole or split grafts.
3. The most marked osteogenesis always occurs in the region of the epiosteum.
4. Of fragmented grafts many pieces die, but slow and scanty osteogenesis does occur around the separate pieces.
5. A fractured graft shows osteogenesis, i.e., callus formation at the seat of fracture, and this is even more marked than the osteogenesis occurring between the ends of the graft and the mother bone.
6. Free periosteum does not produce bone.
7. Bone transplanted into soft tissues atrophies.
8. In a periosteum sleeve from which bone has been removed, then boiled and replaced, a cylinder of callus makes its appearance on the deep surface of the periosteum.

McWilliams' experimental results demonstrated the practical importance of the periosteum. They showed that although nude grafts could live, yet they did so on a much smaller proportion than those transplanted with the periosteum. Split grafts also did better than whole ones. These observations confirm the importance of securing a ready blood supply to the epiosteum and endosteum.

Lexer has had remarkable success in the transplanting of whole joints in human subjects, employing an especially careful technique. Joints taken from freshly amputated limbs or those taken from corpses within twenty-four hours of death may be used.

Living bone tissue can be cultivated *in vitro*, and the resulting phenomena have an important bearing on the problem of the survival of grafts and on the rôle of the different tissues. Dobrowolskaja has carried out this work.

The author's experiments were performed on adult cats, using chiefly the tibia and the femur. He describes his technique and states that living grafts are better than dead; that autogenous grafts are better than homogenous; and that homogenous grafts are better than heterogenous. Sufficient weight of evidence exists to show that graft provided with periosteum and endosteum will more surely live and more quickly grow than a nude graft.

He gives the following summary of experimental results:

1. The most ideal graft is a piece of living bone used in its entire thickness.
2. Any kind of bone-graft gives better results when used whole than when broken up into small fragments.
3. Fragments of living bone, unless closely in contact with vascular tissue, act as indolent and passive structures and display no osteogenesis.
4. Dust formed from living bone does not maintain its vitality.
5. Cortical grafts are far better than intramedullary.
6. An intramedullary graft, if small and loose, takes no part in repair, neither does it act as a splint. If it fits the marrow cavities of the fragment tightly, it hinders osteogenesis and is frequently subject to fracture.
7. The success of the living graft depends very largely upon: (a) the extent of its contact with living bone; (b) the accuracy of its apposition; (c) the firmness of its fixation.
8. Firmness is of paramount importance in the repair of defects in long bones by grafting.
9. A graft of dead bone (boiled) properly fixed by metal sutures will give a better result than a living autogenous graft fixed by catgut alone.
10. Metal sutures and pins are useful in the fixation of many grafts. When properly applied they secure the necessary fixation, and there is no evidence that they hinder osteogenesis.
11. For use as pegs or nails there is no advantage in using living over dead bone.

12. Homogenous grafts, under favorable circumstances, act just as well as autogenous.

13. Dead bone grafts are certainly inferior to living, when used to fill defects in the long bones, but under favorable circumstances they become strongly incorporated into the living skeleton.

14. Provided that secure fixation of the graft to its bed is not disturbed, mobility of the limb favors osteogenesis, while immobilization hinders it.

With regard to clinical methods, exclusion of the skin surface from contact with the fingers and the instrument is very important. It is a matter of clinical and experimental evidence that the occurrence of a slight degree of sepsis does not prevent bone repair, though it generally hinders and delays it.

After a septic fracture, active inflammation may subside until only a sinus remains or this may heal up; and yet in the scar tissue real infective material of a very active sort may remain latent, and any wide opening up of the tissues will cause this latent sepsis to spring into a most malignant activity. In any case where a sinus or any open wound remains it is utterly unjustifiable to attempt a bone-grafting operation. The proper procedure is to extirpate the sinus, and then, when healing has occurred, to wait for several months, treating the limb by massage. If no relapse of sepsis occurs under this treatment, then the further operation may be undertaken.

It must be laid down as a primary rule for bone grafting that cutaneous scar tissue must be replaced by healthy skin before the operation, and deep scars must be excised during the operation.

Whatever view may be taken of the exact function of the periosteum and medulla, there can be no doubt that the preservation of both of these structures is a matter of importance in taking a living graft. Although new bone is probably the product of osteoblasts of the graft, nevertheless it is on the surface of the dense bone, i.e., from the epiosteum and endosteum, that this new bone is laid down. The periosteum and marrow protect these surfaces, and act as vascularizing tissue to them.

It is necessary that a bone which has been grafted should be immobilized for several weeks or months after the operation. A light supporting splint is used for a few weeks, and when the wound is healed the limb is subjected every day to light massage with movements of the joints. In this way the nutrition of the muscles and the flexibility of tendons and joints are preserved, while the formation of new bone is encouraged. ISIDORE COHN.

ORTHOPEDICS IN GENERAL

Lowman, C. L.: Results of Further Study in Leg Rotation. *Boston M. & S. J.*, 1917, clxxvii, 440.

A very high percentage of the posturally relaxed children have faulty foot positions which are mainly acquired but may be congenital. They usually have one or more groups of weakened or overstretched ligaments or muscles caused by a too rapid growth or increase in body weight, plus a faulty gravity line of the leg, or caused by weakness more pathological, such as malnutrition.

Treatment should not be confined to the feet. When the thigh drops into inward rotation from whatever cause, primary or secondary, the weight falls through wrong lines upon the lower leg and foot structures. The control or prevention of this faulty thrust should be the aim in any line of treatment. All children should be stripped for examination although they may have been referred only for weak ankles, flat-feet, knock-knees, or bow-legs.

An ordinary pelvic girdle is made, fitting snugly above the crest and sacrum. Two straps, one and one-half inches wide, of folded coutille or strong muslin, are sewed to this girdle. These pass from the midline posteriorly downward, outward, and forward, crossing the thigh anteriorly to the inside of the knee, over the condyle, behind the bend of the knee, and outward over the outer aspect of the calf, ending in a buckle at about the junction of the middle and lower thirds of the leg. Smaller straps of the same material, broader at their distal extremity and tapered at the top, according to the width of the buckle, are tacked in the shoes just back of the base of the fifth metatarsal. These pass inward under the front of the os calcis and scaphoid, through a slot in the stocking, upward and outward to the buckle on the leg strap. The patient stands on the outer border of the feet while these straps are buckled. On patients who wear a spine brace these straps may be fastened to the brace. In case of flat back the straps may be fastened to the girdle higher up and pass across the crest far enough forward to increase the pelvic tilt and correct the flattening In spiral cases with genu recurvatum, or in cases that toe out markedly, the leg straps should be brought down behind the thigh, passing back of the knee to buckle on the inner side of the leg.

The shoe is usually corrected by having a one-eighth inch raise on the outer border of the sole under the heads of the fourth and fifth metatarsals but not extending to the toe, and a one-eighth inch raise on the inner border of the heel.

General and local corrective gymnastics and balance board exercises are given. Accompanying photographs show the leg harness and the apparatus.

CARL R. STEINKE.

Turner, P.: The Treatment of Trench Foot and Allied Conditions by Bier's Method of Passive Hyperæmia. *Lancet*, Lond., 1917, cxciii, 638.

Raymond and Parisot treat cases of trench foot with gauze compresses soaked in a solution of camphor and borax in boiling water. The author believes that keeping the feet dry rather than wet yields better results. The etiology is summed up by saying that the condition is essentially one of inflammation due to the direct action of cold on the tissues. The histological examination shows that the chief changes are in the blood-vessels. Raymond

and Parisot hold that the cause of trench foot is due to an infection, and claim to have isolated an organism, a mould, scopulariopsis koningii, which is found in the mud of the trenches, and which penetrates the feet. They claim that cold and wet are of secondary importance.

Cases of trench foot are classified according to the severity of symptoms: (a) mild, where the skin is unbroken and there is swelling combined with sensory disturbances; (b) moderate, where blisters or small sloughs, or black and apparently gangrenous areas are present, and the sensory disturbances are more marked; (c) severe, where there are extensive sloughs, ulcers, or gangrenous areas of considerable extent involving perhaps several toes.

Treatment consists of cleansing the foot with soap and water. The feet are then painted with a one per cent solution of picric acid in methylated spirits, and this is repeated at first daily and later every other day. The feet are then wrapped in sterile gauze and exposed to the air until a covering of bed clothing offers more comfort.

As soon as the cleansing process is finished, a constricting bandage is applied just above the knees. It is left on the first day for eighteen hours, removed and re-applied after an interval of six hours. On the second and successive days the bandage is left on 22 hours out of every 24. The bandage is applied tightly enough to impede the venous flow only. There should be no pain; and if present, the bandage should be removed and after an interval again applied.

As a result of this treatment, pain usually disappears rapidly, and as a rule is absent after twenty-four or forty-eight hours. Anæsthesia improves, though not so rapidly as the pain. In cases of moderate severity, the small sloughs and blisters dry up and fall off, leaving a pink skin beneath. In the more extensive cases the gangrenous areas separate and the new skin is pink and very delicate, so that walking in hard shoes cannot be accomplished until the skin has become more toughened.

In slight cases the patient is allowed to walk in soft shoes after four or five days, and two days later is given hard shoes for short periods until the feet gradually become free from tenderness. In severe cases the process is slower. J. J. KURLANDER.

Straus, D. C.: Hammer-Toe. *Surg. Clin. Chicago*, 1917, i, 1081.

The author reports two cases of hammer-toe treated by operation. In one the deformity was in the great toe, having been artificially produced to escape military service. Incision was made on the dorsal surface of the toe lateral to and parallel with the tendon of the extensor longus pollicis.

The head of the first phalanx was cut away by a curved incision and the base of the second phalanx fitted into the curved surface in extension. Joint capsule and severed tendon were then sutured and the toe put up in extension on a plantar splint. After twenty-five days the patient was walking with a straight movable toe. The second case was of the more usual type in the second toe. In this a modified Jones operation was done. By an elliptical incision the callus was removed and the joint opened. The base of the second and head of the first phalanges were removed and the toe put up in extension with fresh bony surfaces opposed. This differs from the Jones operation in that the flexor tendon was not cut. Bony ankylosis was expected.

In hammer-toe of the second toe amputation should not be done because of danger of hallux valgus. In extreme cases nothing short of resection of the joint to produce ankylosis in extension is of any value. W. A. CLARK.

Sohmer, A. E.: Fracture Sprains. *Internat. J. Surg.*, 1917, xxx, 282.

So-called sprains are often associated with fracture of bone near a joint, usually a small fragment of bone being torn off by trauma. If overlooked, these leave the joint in a weak, painful or deformed condition, with limited or abnormal joint motion. It is more important to recognize a fracture in injuries which appear to be simple sprains than one which is frankly a fracture away from a joint, because of the bearing on subsequent treatment.

Fracture sprains disable by aiding the process of callus formation, offering subsequent interference with joint motion, the possible loss of proper attachment of ligaments and tendons, interference with fulcrum action of joints, and more or less dislocation with greater permanent deformity, to the factors of ordinary sprain without fracture.

The prompt recognition of fracture sprains is important in railway surgery because of its bearing on liability claims in cases of prolonged disability and permanent deformity.

To verify a diagnosis, the roentgenogram is the best appliance, either by stereoroentgenogram or plates in different planes. The fluoroscope is not reliable because of the small size of bone fragments and the relative density of tissues near joints.

A knowledge of the development of epiphyses at different ages is important in diagnosis, because of subsequent interference with growth of bones if the true condition is overlooked.

The prognosis of fracture sprains depends on its early recognition and subsequent treatment. They bear an important relationship to constitutional infection elsewhere in body, especially tuberculosis. Lessened lower resistance by injury may lead to local hæmatogenous infection. Treatment should provide for sufficient immobilization, careful massage and passive motion.

Fracture sprains which occur most frequently are the following: fracture of the ulnar styloid, accompanying Colles' fracture; avulsion of trochanters of the femur; condyles of the humerus; fracture of the tip of the olecranon or head of radius, the phalanges of foot or hand, the intrinsic cartilages of the knee, the malleoli of the ankle, and the os calcis.

In all injuries near a joint, every apparent sprain should be considered as complicated by a possible

fracture, until the latter has been excluded by every means of diagnosis, especially by X-ray plates.

Frantz, M. H.: Pseudohypertrophic Muscular Dystrophy. *Med. Times*, 1917, xlv, 279.

Frantz offers a general discussion of this condition, with a report of 2 cases seen within a month.

The author believes that progressive muscular atrophy is an uncommon disease and pseudohypertrophic muscular dystrophy, one of its forms, is still more uncommon.

In the differentiation of this condition he emphasizes: (1) the early onset; (2) the atrophy of the muscles above the pelvic girdle; (3) the pseudohypertrophy of the muscles below the pelvic girdle; (4) the pseudohypertrophy of the calf muscles.

The treatment of the condition is very unsatisfactory. He quotes Sachs and Brooke who advise electrical treatment; Collins and Climenko who found thyroid and thymus extract and strychnine of no value; McCruddin and Sargeant who gave adrenalin and pituitary extract and found in 1 case that the blood-sugar content as well as the cholestrin content increased. The author gave one patient pituitary extract and adrenalin by mouth and after two weeks' treatment the patient showed marked improvement. PHILIP LEWIN.

Halstead, A. E.: Hereditary Deformans Chondral Dysplasia. *Surg. Clin. Chicago*, 1917, i, 951.

This condition is also known as multiple cartilaginous exostosis and multiple congenital osteochondroma. The characteristic findings in this disease are: (1) Multiple and more or less symmetrical osteocartilaginous growths are found upon the skeleton on or near the ends of the long bones, and occasionally on the bones of the face and skull; they have also been found on the pelvic bones and the vertebræ. These exostoses are generally benign, although cases in which they take on a malignant character have been known; (2) in a large percentage of cases the disease is congenital; (3) other malformations are frequently associated with these osteochondromata such as a low stature, due to the shortness of the lower limbs. As a rule the lower limbs are much shorter than the upper. There is also frequently observed a relative shortening of the ulna and fibula producing by the relative overgrowth of the radius and apparent luxation of the bone at one or both extremities. In the lower extremity, the lack of growth of the fibula causes a pes valgus. These deformities may be present before the exostoses make their appearance.

Pathologically, there is a chondrodysplasia affecting the metaphyses of the long bones principally. The epiphyses are rarely deformed. The intermediary cartilage is irregularly formed, and frequently prematurely ossified cartilaginous deposits are found along the shafts of the bone. These may remain unossified or present partly calcified areas. The cartilaginous areas or deposits later may develop into osteochondromata or chondromata.

The prognosis is uniformly bad. No cure is known. When the exostoses limit the movement in a joint by the size and location, they may be removed. The etiology is unknown. J. J. KURLANDER.

Peckham, F. E.: The Treatment of Scoliosis. *J. Am. M. Ass.*, 1917, lxix, 1233.

Peckham believes that true structural scoliosis develops from a diseased condition of the bones and ligaments of the spine. The etiological factor is that which interferes with calcium metabolism; this may be rhachitis, infections, including auto-intoxications, or the rapid growth which often takes place during adolescence. The physiology of the endocrine organs is of great importance, and the thyroid gland in particular, which is supposed to preside over calcium fixation.

Treatment, therefore, consists in the administration of thyroid gland or mixed gland tablets and mechanical fixation in the over-corrected position where possible. R. B. COFIELD.

Parker, C. A.: Acute Suppurative Destruction of the Upper Femoral Epiphysis; So-Called Epiphysitis. *Surg. Clin. Chicago*, 1917, i, 851.

Five cases of acute suppurative arthritis of the hip-joint with destruction of the head of the femur are reported. The pathology is usually a staphylococcus infection metastatic from some focus intercurrent with a general infection, and results in necrosis of the entire epiphysis, but sequestra are not always found.

It is limited in occurrence to the years of epiphyseal growth. The ages of the cases here reported are two, four, and eighteen years. Shortening of the femur always results and usually a flexion deformity.

Most of these cases come to the surgeon after the acute stage, when the treatment necessarily consists in the correction of the deformity. The hip-joint is usually greatly impaired but complete ankylosis is not common.

The correction of the flexion and adduction is accomplished under anæsthetic, subtrochanteric osteotomy sometimes being required; and the leg is held in the extension-abduction position by a plaster cast. Efforts to place the neck of the femur in the acetabulum or to reconstruct the joint are usually unsuccessful. W. A. CLARK.

Mixsell, H. R.: Osteogenesis Imperfecta. *Arch. Pediat.*, 1917, xxxiv, 756.

The condition known as osteogenesis imperfecta is described as synonymous with fragilitas ossium and osteopsathyrosis. Attention is called to the influence of heredity in its occurrence. The multiple spontaneous fractures which occur are the result of a distinct deficiency in bone development, the haversian systems of stress-resisting bony rods being absent and the cortex extremely thin. The skull may feel like a rubber bag with mosaic inlays of small pieces of bone around the centers of ossification with the fontanelles wide open.

Metabolism studies of the patients show that the calcium retention is decidedly below normal. The general appearance is that of chronic illness; the skin is soft and delicate, the child is under weight, mentality poor, neck short, chest asymmetrical, extremities short and curved with any sort of deformity due to the fractures. The fractures are usually intraperiosteal and the callus formation is excessive. Structural markings in the spongy bone are absent and the medullary cavity is large showing irregular mottled shadows in the roentgenogram.

Two cases are reported; one, a child of eight months, had fracture of both femurs at birth, and three more painless spontaneous fractures in the first seven months. The skull was tabetic and the back kyphotic. The child improved on cod-liver oil and phosphorus. The other case, a year old, showed many lumps of callus on clavicle, forearms, thighs and legs, an evidence of multiple fractures. The child improved under the same treatment.

W. A. CLARK.

Lovett, R. W.: Orthopedic Problems in the After-Treatment of Infantile Paralysis. *Am. J. Orthop. Surg.*, 1917, xv, 687.

The author presents the five problems in the after-treatment of infantile paralysis which have given him the most trouble personally and about the settlement of which there is not always agreement among men of large experience. He believes:

1. That paralytic poliomyelitis is more often a weakening than a total paralysis of the affected muscles; that contractions are detrimental and troublesome and must be guarded against from the outset.

2. That the use of braces is conservative and preventive rather than therapeutic.

3. That fatigue is dangerous, easily induced and temporarily or permanently detrimental; that conservation and improvement of the affected muscles must constitute the aim of the orthopedic surgeon.

4. That of the therapeutic measures available for use in the after-treatment, muscle training meets the physiological and pathological requirements, but to be effective it must be based on a thorough and accurate muscular diagnosis and must be carried out with optimism, persistence and accuracy.

5. That such treatment has a definite effect upon the prognosis and is likely to furnish the orthopedist with a degree of improvement and a proportion of complete recovery that is not, as a rule, considered possible.

PHILIP LEWIN.

Ryerson, E. W.: Tendon Transplantation for Relief of Paralysis Following Anterior Poliomyelitis. *Surg. Clin. Chicago.*, 1917, i, 721.

The case reported is that of a boy seventeen years old with flexion deformity of both legs and of the left thigh resulting from infantile paralysis followed by contractures of the muscles opposed to the paralyzed muscles. Operation in such cases is not advised until after two years at least, during which time repair is thought to take place.

In this case the paralyzed muscles were the quadriceps extensors of both thighs. The patient was unable to walk because he could not extend his knees, although the feet were in good condition. In order to restore the balance of muscle power about the knees, the semitendinosus and long head of the biceps were transplanted from their tibial insertions to the tendon of the quadriceps extensor at the patella.

First the flexion at the left hip was overcome by cutting the tensor fasciæ latæ at its origin under the crest of the ilium, the sartorius and rectus femoris muscles also at their origins. Incision was then made in the middle of the back of the thigh from the level of the head of the tibia upward almost to the tuberosity of the ischium. The long head of the biceps was dissected out, cut from its insertion and a kangaroo tendon woven into it. The tendon of the semitendinosus was treated in the same way. Plastic lengthening of the short head of the biceps had to be done to allow extension of the knee but the internal popliteal nerve still prevented immediate complete extension, so a Buck's extension was applied after the operation. The knee straightened in two weeks.

Incision was then made from the lower edge of the patella upward four inches and communication between this and the posterior incision made by dissecting back on each side of the condyles. Forceps were inserted from in front and the severed tendons picked up, pulled through and sutured into grooves cut in the periosteun of the patella. Since the biceps tendon was not long enough by an inch and a half, the bridge was supplied by the kangaroo tendon. The legs were kept extended in casts for six weeks.

W. A. CLARK.

SURGERY OF THE SPINAL COLUMN AND CORD

Bauman, G. I.: Treatment of Tuberculosis of the Spine. *Cleveland M. J.*, 1917, xvi, 657.

The author describes the method of treatment for spinal tuberculosis which he uses at the Rainbow Hospital, Cleveland. The children are placed on hyperextension frames; any pressure between the diseased bodies of the vertebræ is avoided as far as possible. There is a marked decalcification in the area involved, leaving a soft, pliable mass which is held together only by the natural resistance of the soft parts, the thin bony framework posteriorly, and the contraction of the muscles. This mass can easily be disturbed by motion or compression. Efforts are made to hold the spine quiet, to avoid

the pressure of the weight of the body above the diseased area, and to promote healing.

It is gratifying to the author to note that the importance of recumbency in the treatment of the acute stage is receiving due credit. If it is combined with the proper amount of hyperextension and constant out-of-door living, the patient will be at the greatest advantage in combating the infection and the likelihood of subsequent deformity.

Various forms of hyperextension may be used, the gas-pipe frame, the plaster-of-Paris bed, mattresses or boards; decision should be left to the discretion of the surgeon. The author prefers the plaster or celluloid bed.

The period of recumbency varies with each patient and should be governed entirely by the progress of the case. In general, it should not be less than one year in the acute case.

"It is difficult sometimes to judge of the progress of the disease, but the following points are of value in determining the advisability of getting the patient up: the amount of recalcification and consolidation as shown by the X-ray; the progress of the deformity as shown by periodic tracings; loss of muscle spasm; complete absence of fever; no demonstrable abscess and no sinus. Probably most important of all is the behavior of the patient. These children lie perfectly happy and contented for months at a stretch during the acute stage and make practically no effort to get up. As the local condition improves the child manifests increasing activity, moving first its arms and legs more freely, then the head and spine. It finally becomes so active that further restraint is seen to be unwise if not impossible. A brace or celluloid jacket is then made and the child gradually gotten up. The lack of muscle atrophy is surprising in these cases. In fact the muscles often seem to develop as the child improves in bed."

Bauman believes that as a rule little reduction in the kyphos is obtained. Regarding heliotheraphy he says that the first exposures should be short in order to avoid sunburn and should cover only a small part of the body. Beginning with the feet for ten to fifteen minutes, the area and the time are gradually increased. When one side of the body has been covered the other side may be taken. The total length of exposure varies from a few hours to practically the entire day. Improvement is much more noticeable after pigmentation is established.

The author states that fixation operations should be reserved for selected cases. He always makes a plaster bed before the operation so as to turn and handle the patient without shock or injury. Extreme care should be observed in handling the patient while under an anæsthetic, as the natural protection of the spastic muscles is lost. Recumbency and external fixation should be continued indefinitely after operation. The operation is confined chiefly to older children and adults; cervical and lumbar cases and very young children are excluded.

The author's conclusions are as follows:

Tuberculosis of the spine should be treated as a local manifestation of a general tuberculosis. Rest, heliotherapy, fresh air and good food are important, benefiting the local as well as the general condition. Abscesses should not be operated upon unless absolutely necessary. Fixation operations should be reserved for selected cases. PHILIP LEWIN.

Celesia, A.: Hydatid Cyst of the Vertebral Column (Quiste hidatico de la columna vertebral). *Prensa méd. argent.*, 1917, ly, 114.

Celesia reports the case of a woman who showed pain in the lower limbs, incontinence of urine, vesical tenesmus and a flaccid paraplegia and contraction of the lower limbs. Later after a feeling of suffocation she expelled some hydatid vesicules by mouth. Radioscopy showed a clear oval zone at about the level of the sixth, seventh, and ninth dorsal vertebræ. On operation a focus of osteitis was found in the ninth dorsal vertebra and the corresponding rib on the right side; also a hydatidosis with small and multiple vesicules. The ninth rib was resected and disclosed a similar focus existing in the eleventh. A laminectomy was then made in order to examine the medulla, the dura mater opened and sutured immediately. The author tamponed the cavity containing the vertebral body; no toxic liquid was injected owing to the vicinity of the medulla. W. A. BRENNAN.

Main, D. C.: A Case of Injury to the Spinal Cord. *Med. Times*, 1917, xlv, 289.

The author reports the following case:

The patient was a negro, 28 years old, very robust, with no lues present. While loading logs, he fell from the top of the loading machine, striking the soles of both feet squarely upon a heavy timber. He complained of considerable pain in the lumbar region, in both legs and in his feet. He was removed to a hospital, put to bed and packed with sand bags. Urinary incontinence was continuous.

Three months after the accident examination revealed an injury to the spinal cord. At the junction of the last dorsal and the first lumbar vertebræ there was a bony ridge, very hard and non-compressible, evidently an impaction of the vertebræ.

Under general anæsthesia an incision four inches long was made in the region of the injury. On uncovering the injured vertebræ, no line of separation could be found. A laminectomy was done and three small blood clots removed. A year afterward the patient was working in the lumber camp, in good condition. Three years afterward he was still engaged in the same work. C. A. BOWERS.

Gonzalez, C.: Operation and Result in a Case of Spina Bifida (Un caso de espina bifida operato con exito). *Rev. de med. y cirug. prâct.*, Madrid, 1917, xli, 167.

Gonzalez reports a case of spina bifida in a child forty-four days old operated upon by Suner of the Pediatric Clinic in the University of Valladolid.

The child was anæsthetized with chloroform. A circular incision was made around the base of the tumor. A second incision sectioned the meninges and gave issue to the spinal fluid in great force, instantaneously emptying the sac and disclosing the cauda equina which was integrate in every respect. The lips of the large wounds were quickly clamped to prevent any further escape of the spinal fluid and to avoid fatal cerebral shock. At this moment the patient showed intense pallor with a weakening of the cardiac beats, but reacted to physiological serum. The suture of the membranes and the skin was rapidly done; the operation lasted 14 minutes. The child showed only a slight febrile reaction and the wound cicatrized in 38 days.

Two months later the child was in perfect health. The fontanelles show no dilatation, nor is there any symptom of intracranial pressure nor of reproduction of the tumor. W. A. BRENNAN.

Gaenslen, F. J.: Simplified Technique in Laminectomy, with a Description of Combined Laminectomy and Spine Fixation by Bone Transplant. *J. Am. M. Ass.*, 1917, lxix, 1160.

The advantages claimed for the technique here described are: (1) rapidity of the operation; (2) diminished trauma; (3) diminished hæmorrhage; (4) more accurate and firm closure and the possibility in suitable cases of combining with this method of laminectomy a spinal fixation by bone transplant.

The essential point lies in the fact that instead of stripping the soft parts and the periosteum from the posterior vertebral spines on either side and then cutting off the spines at their bases, the spines are split longitudinally into right and left halves, just as in the Albee operation for Pott's disease. However, instead of deflecting the halves on one side only, they are deflected on both sides. It is then a simple matter to separate the periosteum with the attached soft parts from the laminæ as far laterally as the articular processes. There is then left only a small amount of the process to be cut away with bone-cutting forceps, and the cord is exposed.

In certain instances, after laminectomy for urgent cord pressure symptoms, it may be desirable to fix the spine by means of a tibial transplant immediately after decompression of the cord. The method of approach, indicated above, by preserving the spinous processes and therefore retaining the usual number of bony contact points, paves the way for a successful bone graft. R. B. COFIELD.

Evans, W. A.: "Quiet" Pott's Disease. *Am. J. Roentgenol.*, 1917, iv, 530.

The case is reported of a child having marked destruction of the body of the fourth lumbar vertebra and involvement of the contiguous portions of the third and fifth, with prevertebral abscess, all of which was shown by roentgen examination. The only known symptoms were occasional slight pains in the left leg; there was no impairment of the general health. A small lump in the lumbar region led to the examination and discovery of the pathology. ADOLPH HARTUNG.

MISCELLANEOUS

CLINICAL ENTITIES—TUMORS, ULCERS, ABSCESSES, ETC.

Bullock, F. D., and Rohdenburg, G. L.: The Relation of Induced Cancer Immunity to Tissue Growth and Tissue Degeneration. *J. Cancer Research*, 1917, ii, 455.

The authors assert that immunity can only be induced when the immunizing material consists of live cells derived from the animal species in which the tumor originated. Assuming this to be true, immunity may be due then either (a) to the growth or growth metabolites of the injected material as suggested by Haaland; or (b) to the death and degenerative metabolites of the injected material; or (c) to growth followed by death with their respective metabolites.

Dead cells are incapable of inducing the resistant state. Also tumor cells showing a rapid and prolonged power of growth do not invariably have the power of producing immunity. In one experiment the immunizing power of cartilage and bone was compared with that of fœtal skin. The result showed that immunity was present in 39 per cent of the animals injected with embryo skin, as compared with 19 per cent in the group injected with fœtal cartilage and bone, and 8 per cent in the non-treated controls. It is suggested that a greater activity in the production of metabolites may exist in the embryo skin on account of the larger number of cells and active proliferation as compared bulk for bulk with bone or cartilage. Large doses of embryo skin (0.05) injected for purposes of immunization degenerate rapidly, producing a large amount of necrotic material, while small bits of embryo skin grow and retain their viability for weeks.

The second experiment was for the purpose of finding out the induction of immunity through the absorption by the animal of some product of cell degeneration. For this purpose massive doses of the Flexner-Jobling rat carcinoma were used for the inoculations. The results of this experiment showed practically no increase in the immunity. An attempt was also made to cause immunity through the production of large amounts of necrotic tumor material by means of obliteration of the blood supply of the

tumor after the method of Rowen. The result of this experiment showed that very slight immunity, 14 per cent, resulted from the procedure, while the destruction of the blood supply did not prevent the further growth of the tumors.

In conclusion the authors state that induced immunity to transplanted cancer is not solely due to growth or the metabolites of growth of the immunizing agent, nor is it due to death and degenerative metabolites of the injected material.

L. C. GOLDSMITH.

Greenough, R. B.: The Handling of Early and Doubtful Cases of Cancer. *Ann. Surg.*, Phila., 1917, lxvi, 385.

The author sent out a circular letter to a large number of surgeons in this country in which he asked their opinion upon the removal of small pieces of tissue in suspected cases of malignancy in order to make a definite diagnosis. One hundred and thirty-four replies were received. As a result of the analysis of these replies, the author recommends the following procedure in the diagnosis of early and suspected cancer of different organs:

1. In suspected but doubtful lesions of the external skin, lip, tongue, palate, tonsil, buccal mucous membrane and rectum, excision of the entire growth, if small, should be performed. If large, excision of a portion of the growing edge of the lesion followed by cauterization is to be advised only after all other resources of clinical diagnosis, including consultation, have been employed, and then only when the facilities for immediate frozen section diagnosis are available and the operation for carcinoma, if it should prove necessary, can be completed under one anæsthesia.

2. In suspected but doubtful lesions of the gall-bladder, kidney, prostate, testicle and ovary, removal of the organ should be practiced since the difference in severity of the possible operations for benign and for malignant disease is not sufficient to make an exploratory incision into suspected carcinomatous tissue a necessary or advisable procedure.

3. In suspected but doubtful lesions of the lymph-nodes in the neck, axilla, and groin, in cases where radical operation is a possibility, block dissection of the area involved, including the adjacent nodes, is to be recommended in preference to the excision of a single suspected nodule. In obviously hopeless cases, should cancer be present, removal of a single node may prevent a useless operation and is to be recommended.

4. In cases of sarcoma and obscure tumors deeply placed, exploratory removal of tissue cannot be recommended except when all facilities for radical operation are at hand; immediate frozen section diagnosis then should be secured.

5. To these recommendations may be added the routine pathological examination of all tumor tissues removed by operation. This should be made compulsory and to this end competent laboratories for the free diagnosis of pathological material should be maintained as a function of the State.

GATEWOOD.

Skillern, P. G., Jr.: A Case of Melanocarcinoma Showing Its Stealthy Nature and Rapidly Malignant Course. *Med. & Surg.*, 1917, i, 822.

Melanocarcinoma exceeds nearly all malignant neoplasms in rapidity and virulence of growth. Second to this are chorio-epithelioma and cancer of the tongue.

The patient in the case reported had since birth a black pigmented mole over the left mastoid. About three years ago after a slight injury the mole bled. Thereafter irritating objects which came in contact with the mole caused it to bleed. After these irritations the mole began to increase in size. Two years ago the mole was removed by an operative incision. There has been no recurrence in the scar.

Four months previous to admission the patient noticed for the first time two lumps on the left side of the neck behind the angle of the jaw. One month before admission these lumps became painful. On examination these tumors were smooth and regular in outline, slightly reddened, sensitive, apparently fluctuant, and firmly adherent. The diagnosis of recurrent melanocarcinoma was made. Despite radical removal of the tumors recurrence followed three weeks after operation, metastases to the lungs were revealed soon afterward, and the patient succumbed within three months of the operation.

Characteristic of a subcutaneous melanocarcinoma is the inflammatory appearance of the skin, which is of a dusky red hue. Care should be observed in incising such a tumor, under the mistaken impression that it is a phlegmon.

Pathologically melanocarcinoma arises as a migratory hyperplasia of the basal layer of the skin and invades the subcutaneous tissues and distant organs as pigmented and non-pigmented oval, spheric, or spindle cells. The author does not discuss the choice of terms, melanocarcinoma or melanosarcoma; but when the neoplasm arises in the skin, as in the case to hand, it is properly termed melanocarcinoma. For practical purposes it is necessary to perform wide excision of black pigmented moles which are exposed, before they have been subjected to trauma.

Guthrie, C. C.: Experimental Shock. *J. Am. M. Ass.*, 1917, lxix, 1394.

The attempt has been made to devise a reliable and comparatively simple method of producing shock; to establish definite criteria for recognizing the condition and to observe and study at frequent intervals throughout the experiment as many phenomena simultaneously as was feasible; the author proceeded on the assumption that the grosser manifestations of shock were to be considered effects rather than causes. Accordingly, if the causative mechanism were to be observed, it would be most desirable to study minutely the phenomena

immediately preceding, during and following the application of the means used for producing shock, and to observe the effects of such therapeutic measures as might be indicated by the results.

Experiments were made on twenty-two dogs. The studies comprised blood-pressure, pulse-rate and character; vasomotor reflex response; vasomotor tone; respiration rate, amplitude and regularity; volume and composition of expired air; blood hydrogen-ion concentration, reserve alkalinity, hæmatocrit and hæmoglobin tests, red cell count and specific gravity determinations; from which alterations in the composition of the blood as regards relative volumes of plasma and corpuscles, as well as estimations of relative changes in the total volume of blood, were made; estimation of the total blood contained in the vessels of the alimentary canal and in the vessels of the liver; viscosity and depression of the freezing point of blood; and temperature and condition of the general reflexes, i.e., the knee, eye, etc. Comparative studies were made on conditions observed in shock, and conditions following the induction of cerebral anæmia. The effects of remedial measures were observed, as mechanical increase of cerebral pressure by occluding the aorta; elevation of the posterior portion of the animal to facilitate return of blood to the heart; and administration of drugs, including epinephrin, tyramin, atropin, sodium bicarbonate, lactic acid, and inhalations of carbon dioxide.

The author attributes the earlier stages of the condition termed shock, observed in his experiments, largely to degradation and fatigue of the bulbar centers due to ether poisoning and to sensory nerve stimulation; and the more profound stages to inadequate circulation to meet the bulbar tissue demands. Though all of the blood circulatory phenomena are closely related and interdependent, perhaps the lowest capillary pressure and hence the sluggish return flow of blood to the heart, rather than venous dilatation, is a more comprehensive standpoint from which to picture the condition in shock. Among probable early derangements augmenting the condition, he states, are vasomotor changes affecting the venous tone.

Treatment when instituted in the earlier stages yielded good results; in later stages, results were less satisfactory, owing presumably to irreparable injury to the central nervous system.

Therapeutic measures capable of restoring an adequate cerebral circulation, instituted before irreparable tissue injury had occurred, led to recovery. Such measures, Guthrie states, should be preferably of a mechanical nature, as elevation of the posterior parts of the body, with the view of increasing a return of blood to the heart and adding a hydrostatic factor to the cerebral blood-pressure; increase of peripheral resistance as by aortic compression; and, particularly when associated with severe hæmorrhage, increase of blood volume by transfusion of blood or the intravenous injection of isotonic nontoxic solution, as sodium chloride.

Theoretically and from the standpoint of increase in blood volume only, injection of hypertonic solutions would be indicated. The recent observations of Sansum on the marked increase in arterial blood-pressure associated with and following intravenous injection of strongly hypertonic glucose solutions he considers very suggestive.

Temperature, if low, should receive attention, but the main indication is promptly to institute and to maintain an adequate cerebral circulation.

In the case of drugs, the best results have been obtained with epinephrin solution intravenously. Drugs were selected with the view of increasing the peripheral resistance and augmenting the return of blood to the heart by direct action on the blood-vessels.

Guthie believes that these considerations of treatment, with added considerations to meet the psychic factor, apply to shock in man. For example, in acute psychic shock, inhibition probably plays a leading rôle. In the series of experiments reported in the present paper there was little evidence that inhibition was a factor. GEORGE E. BEILBY.

Erlanger, J., and Woodyatt, R. T.: Intravenous Glucose Injections in Shock. *J. Am. M. Ass.*, 1917, lxix, 1410.

On theoretical and experimental grounds supported by some clinical evidence, it would appear that intravenous injections of glucose at appropriate rates are of distinct benefit in certain phases of shock.

Glucose injected intravenously at rates varying between 0.57 and 4 gm. per kilogram per hour for from 20 to 60 minutes into anæsthetized dogs reduced to a state of shock by partial temporary occlusions of the inferior cava or aorta has been observed uniformly to increase the mean arterial pressure.

The injections have uniformly produced a marked increase in the pulse amplitude, indicating a condition of plethora. The increase in pulse amplitude has usually been more striking than the increase in arterial pressure. In one case the increase in pressure determined by the injection of glucose continued after the cessation of the injection until the pressure was approximating the normal.

A subtolerant dose has raised the arterial pressure and increased the pulse amplitude as effectively as many of the injections made at more rapid rates. With the more rapid injections, a marked hæmorrhagic tendency may develop in animals in this condition. No other palpable deleterious effects were observed. EDWARD L. CORNELL.

Bayliss, W. H.: Treatment of Shock by Intravenous Injections (Le traitement du shock par les injections intraveineuses). *Arch. méd. belges*, 1917, lxx, 793.

Bayliss refers to states of shock especially characterized by lowering of the arterial pressure. In hæmorrhage the most logical treatment is to replace

the lost blood. In the fluid employed two properties are indispensable, i.e., viscosity, and the osmotic pressure of colloids. In animal experiments the author has found that if the blood-pressure be reduced by the extraction of a certain quantity of blood, the pressure is only partially re-established if the same quantity of Ringer's solution be injected.

However, if 6 per cent of gum arabic be added to the solution, the blood-pressure is completely re-established. Other substances such as gelatine give the desired viscosity to the solutions, but for various reasons they are not so suitable as gum arabic. Moreover, a 6 per cent gum arabic solution has the same osmotic pressure as blood. The œdema which is usually manifested sooner or later with the use of Ringer's solution alone does not occur when the gum arabic is added to it. The gum arabic is easily sterilized by boiling. A 4 per cent solution of gum with 0.9 per cent of chloride of sodium has been found excellent for experiments with cats and a concentration of 2 per cent has been successfully employed in man. No anaphylactic effects have followed the use of gum in animal experiments.

The author considers the use of the solution in shock due to conditions other than hæmorrhage, where there is strong concentration of the blood.

W. A. Brennan.

Amberg, S., Loevenhart, A. S., and McClure, W. B.: The Influence of Oxygen upon Inflammatory Reactions. *J. Pharmacol. & Exp. Therap.*, 1917, x, 209.

The authors conclude that intravenous injections of the sodium salts of O-iodoso and O-iodoxy benzoic acids inhibit the mustard oil reaction of the rabbit conjunctiva as well as that of the skin. No other visible changes in the organism accompany this inhibitory action. Other substances containing chemically active oxygen such as the sodium salts of diphthallic peroxide, iodic and periodic acids have an inhibiting action on the mustard oil inflammation.

It seems reasonable to ascribe the inhibiting action of these substances to the chemically active oxygen. Exposure of rabbits to atmospheres with reduced partial pressure of oxygen did not have any marked effect on the intensity of the intracutaneous mustard oil reaction. Intravenous injections of sodium cyanide seem capable of intensifying the conjunctival mustard oil reaction under proper conditions. Within certain limits an influence on tissue oxidation seems to determine an inhibition or intensification of the response to inflammatory stimuli. It seems possible to alter the character of the conjunctival mustard oil reaction by intravenous injections of substances such as sodium hypochlorite. Irritation produced elsewhere in the organism, as by intraperitoneal injections of kaolin, animal charcoal, and mustard oil, may exercise an inhibiting influence on the conjunctival mustard oil reaction of the rabbit.

Max Kahn.

Kermisson, E.: Infantile Surgery. *Med. Press & Circ.*, 1917, civ, 329.

The author reports two cases of Meckel's diverticulum, one in a boy of fourteen who was admitted as a case of appendicitis. The contrast was marked between his excellent general state and the distention of the abdomen, which suggested an intestinal obstruction. On opening the abdomen a large quantity of yellowish serum escaped. The cæcum came into view and could only with difficulty be drawn out, being strongly adherent farther down. The appendix, which ran in the direction of the true pelvis, was resected.

The index finger, passed down toward the brim of the pelvis, felt a mass of intestinal loops, bound together by a constricting band. A Meckel's diverticulum was found measuring 7 or 8 cm. in length, the caliber of the small intestine. It was attached to the free edge of the latter, some 20 cm. above the ileocæcal angle. From the top of the diverticulum ran a fibrous band containing an artery and two veins, the other end of which was inserted into the free edge of the intestine a few centimeters above the point of implantation of the diverticulum. In the loop thus formed a piece of small intestine was fixed, but was not very tightly constricted. The band was divided between two ligatures, but in view of the size of the diverticulum it was not resected in order not to unduly prolong the operation. The sequelæ were uneventful and the patient left the hospital in a few days.

Two months later the patient was seized with pain in the abdomen. Bowel movement was accompanied by sickness. On the strength of the information gained at the previous operation, it was decided to open the sheath of the right rectus muscle. Some loops of intestine bound together by adhesions were discovered. After breaking down these adhesions, the diverticulum itself was recognized in one of these very adherent and conjested loops. After freeing it from its adhesions, it was pulled outside the abdomen with aseptic gauze. A forceps guarded with rubber tubing was applied to the base of the diverticulum, which was crushed close to its point of insertion, and was then divided with the electric thermocautery. A continuous suture was run around the edges of the divided gut and over this a seromuscular Lembert suture. The various adhesions that had been divided were tied with fine catgut. The peritoneum was carefully cleansed from blood and serum and the walls were sutured in three layers after placing in position a drain to be left 48 hours. Recovery was uneventful and the patient left the hospital in four weeks.

The second case, that of a male infant eight months of age, in good general health, was brought in with a stercoral fistula of the navel. The fistulous orifice rested upon a small, rounded tumor of a bluish-red color, which, when the child cried, increased notably in length in consequence of the prolapse of the intestinal mucosa. The child was operated upon, beginning by the application of a ligature around the base of the tumor in order to

prevent the escape of fæces. After disinfecting the skin, an elliptical incision was made around the tumor. The diverticulum was then gently drawn outside the abdomen, together with the small intestine to which it was adherent. It measured about 3 cm. in length and was inserted, not on the convex border of the intestine, as is usually the case, but close to the mesenteric border. Resection was done with the thermocautery after ligature with catgut; the stump was buried by the aid of a silk suture passing through both the intestinal wall and the layer of mesentery. The child recovered without incident and was discharged in a fortnight. A month later he was in excellent health with a sound cicatrix.

EDWARD L. CORNELL.

SERA, VACCINES, AND FERMENTS

Bohan, P. T., and Lynch, L. A.: A More Delicate Wassermann Reaction Depending on the Use of Increased Quantities of Blood Serum. *J. Am. M. Ass.*, 1917, lxix, 1220.

This report is based on observations made on 200 patients examined serologically for evidences of syphilis, over a period of one and one-half years. The authors have attempted to develop a Wassermann technique which would agree in a larger percentage of cases with the clinical diagnosis of syphilis and which would enable investigators to attach some significance to the negative Wassermann reaction.

Their method consisted essentially in the use of graded increasing amounts of blood serum and spinal fluid, each serum being tested in the following amounts: 0.1 ccm., 0.3 ccm., 0.5 ccm., and 1 ccm., while amounts of spinal fluid as high as 10 ccm. were used in a single test.

Their investigations showed that as much as 1 ccm. of serum might be safely used and that a negative reaction with 0.1 or 0.2 ccm. of serum was of little or no value in excluding syphilis in the latent or inactive stage such as locomotor ataxia. In the cases reported by the authors which required the use of increased amounts of serum to obtain a positive reaction, the diagnosis of syphilis was made by other means, such as a history of chancre, clinical findings and tests of the spinal fluid. In fact, in every case giving a positive reaction when 1 ccm. was used they obtained positive findings in the spinal fluid, such as a positive globulin test, a typical colloidal gold chloride test, and a positive Wassermann reaction when a sufficient amount of fluid was used. However, they seldom found it necessary to use more than 5 ccm. of spinal fluid.

In conclusion, the authors found that with larger quantities of serum a higher percentage of positive reactions was obtained, and with this technique, if the serum was fresh, 1 ccm. was not more anticomplementary than smaller quantities. Normal serum did not cause complement fixation when 1 ccm. was used. Their investigations corroborated the statement by Lange that in non-syphilitic cases negative reactions were obtained in the spinal fluid with 10 ccm.

A negative reaction with an increased quantity of serum did not positively exclude latent syphilis. In 4 per cent of known syphilitics there was no inhibition of hæmolysis when 1 ccm. of serum was used.

A Wassermann test made with graded quantities of serum is not only an index of the activity of the syphilitic process but is of value in indicating the progress of the case under treatment.

GEORGE E. BEILBY.

Emery, W. D.: The Retraction of Blood-Clots, with Two Methods for Securing a Large Yield of Serum. *Lancet*, Lond., 1917, cxciii, 597.

Blood collected from the living body in a non-living vessel clots after a longer or shorter time; at first the clot is a uniform, soft mass. After a period which varies from a few minutes to several hours, it usually begins to contract, and in doing so leaves a larger or smaller amount of serum, mixed in most cases with red corpuscles and leucocytes. This serum makes its appearance between the clot and the sides of the vessel and on the surface of the clot. The clot is heavier that the serum and tends to sink, so that when the process is completed it forms a dark purplish mass of the shape of the containing vessel, lying at the bottom of a greater or smaller amount of serum.

In the first stage of coagulation a fine network of filaments of fibrin is formed, enclosing within its meshes serum, red corpuscles and leucocytes. In the second stage each filament tends to contract, the serum and some of the red corpuscles are squeezed out, and a firm mass of fibrin containing a relatively small number of red corpuscles is left, the leucocytes making their way through the clot by their own active movements.

The effect of this contraction of the fibrin filaments differs in the center and periphery of the clot, the retraction beginning at the periphery, either at the sides of the vessel or on the surface of the clot. The serum which appears on the surface of the clot is usually turbid from red corpuscles, while that appearing between the clot and vessel wall is quite clear because of the settling of corpuscles.

There are factors which cause a difference in the retraction of different clots; some retract quickly and give an abundant crop of serum, and others retract slowly, giving a smaller crop, or fail to retract at all. Internal factors are those which differ in different specimens of blood. External factors are the size and shape of the containing vessel, the nature of its walls, the temperature and gravity. The force tending to draw the clot away from the surface is largest in small tubes, getting progressively less in large tubes.

In conducting his experiments the author has used human blood drawn directly from the veins into a tube lined with paraffin, in which it remained unclotted for a sufficiently long time to permit the

experiments to be made and measurements to be made when necessary with paraffined pipettes.

The experiment was conducted by dividing the same specimen of blood into tubes of the following diameter: 1 mm., 4 mm., 9 mm., and 17 mm., at room temperature. In 1 mm. tubes retraction was abundant in half an hour and the yield of serum was 56 to 59.6 per cent. In 4 mm. retraction was noticeable at the end of an hour, with a yield of 29.2 to 30.7 per cent of serum in twenty-four hours. In the 9 mm. tubes there was but slight retraction at end of four hours, with a yield of 6.3 per cent to 21.5 per cent serum in twenty-four fours. In the 17 mm. tubes no retraction occurred in twenty-four hours and there was no serum.

The author states that blood collected in capillary tubes always contracts completely, yielding the full theoretical amount of serum. In most cases it commences in less than fifteen minutes and is complete in one-half hour. In tubes having a diameter of 3 to 4 mm. retraction generally takes place and is usually complete but occasionally is only partial and is much slower than in capillaries. In Wassermann tubes retraction is the rule but there are occasional exceptions; action is much slower and not complete as a rule in less than from twelve to twenty-four hours. In large test-tubes it is frequently absent, always slow and often incomplete.

In general, the newer and cleaner the vessel the easier and quicker is the retraction. A clot will not detach itself from a paraffin-lined tube. The author does not think that a clot formed in a living vein retracts from the walls, never having seen an example in sections of thrombosed veins.

If a freshly formed clot be suspended in air, the process of expression is very rapid, the contraction of the fibrin being assisted by the force of the serum; but if the clot remains in the serum this assistance from gravity is very much less. In narrow test-tubes the clot remains adherent by a rim of attachment at its upper angle of contact with the wall of the tube. Retraction always begins at some point on the side and continues until every point except this rim of attachment has detached itself from the wall. Such a clot has a wide top, a narrow neck and a wider base, which is often almost as wide as the tube and may in some cases be almost spherical. The shape is due to the action of gravity on a soft mass, originally cylindrical, which is lifting itself up by the contraction of its surface membrane.

When the clot is first formed it has a specific gravity of 1,056. As soon as retraction commences some of the serum, which is lighter (sp. gr. 1,030), escapes. As the clot shrinks, specific gravity rises, ultimately reaching almost 1,100.

In large vessels the rim of attachment will not hold, and the clot sinks to the botton. This is because the length of the rim increases only proportionately to the diameter of the vessel, while the weight of the clot rises in proportion to its cube. Gravity assists in that the upper part of the clot presses on the lower and tends to press out the serum, but the conditions are much less favorable, for the clot may be pressed against the walls of the vessel and the serum be prevented from escaping; also the compressing force exerted by the upper part of the clot tends to counteract the contraction of the lower part.

The nearer the temperature of the vessel to that of the body, the quicker and more complete will be the retraction. Retraction is hastened at incubator temperature. In an ice-chest retraction is usually absent or very slight in anything larger than a capillary tube, and may be incomplete in these. A point of considerable importance is that the temperature to which the blood is exposed when first drawn is of chief importance in determining the rate and completeness of retraction. In order to collect as much serum as possible, the blood should be collected in warmed tubes and incubated as soon as possible. After an hour or two it may be kept at room temperature, but the ice chest should be avoided until retraction is complete.

There are two methods for obtaining a very full crop of serum:

1. A test-tube is bent about the middle to an angle of 135°; after it is sterilized a small amount of melted paraffin is poured in, heated, and the tube kept upright until it is cold. When set, the paraffin will form a layer at the bottom of the tube. The tube is filled with blood short of the angle and kept upright in the incubator until coagulation has taken place. Then it is slightly tilted on the side so that the serum may draw into the angle. In a test-tube containing 8 to 10 ccm. of blood retraction will usually be complete in two hours or less and the clot will stick to the paraffined surface of the tube.

2. Another method is to paraffin the side of a flask. The blood is allowed to clot in contact with this surface, the flask being kept on its side. When coagulation is complete, the flask is turned so that the blood is uppermost. The serum will be very rapidly expressed and will form a pool on the opposite side of the flask. V. C. HUNT.

Nuzum, J. W., and Willy, R. G.: Specific Serum Therapy of Epidemic Poliomyelitis; a Report of 159 Cases Treated with Antipoliomyelitic Horse Serum. *J. Am. M. Ass.*, 1917, lxix, 1247.

The mode of production, the technique of administration, and the results obtained in a series of 159 cases of epidemic poliomyelitis treated with antipoliomyelitic serum prepared in the horse by injections of the poliomyelitic coccus are reported. These patients were treated in the Cook County Hospital during the epidemic which prevailed throughout the summer and autumn months of 1917 in Chicago.

The authors point out that the detection of neutralizing substances in the blood serum of both monkeys and human beings following an attack of poliomyelitis, and the observations of Flexner and Lewis on the protection of inoculated monkeys by means of injections of serum of recovered monkeys

apparently has furnished the basis for serum therapy in man. Netter and several others have reported favorably on the treatment of poliomyelitis in man by injections of immune serum from convalescent patients. Unfortuantely, however, there would seem to be several disadvantages attendant upon this method. Chief among these is the difficulty in securing serum in sufficient quantity properly to treat any considerable number of patients; and still more important is the probable low antibody content of human serum as compared with an immune serum produced in the horse by injections of the causative micro-organism.

The authors found it possible to identify the coccus by the use of immune horse serum, employing the dilution method for estimating the point of opsonic extinction. This reaction was specific for the poliomyelitic coccus. They have recently shown that repeated intravenous injections of the coccus in the horse produce an immune serum rich in agglutinins, complement fixation bodies, and especially opsonin; and such a serum has been shown to possess protective and curative properties against fatal doses of virulent virus in experimental poliomyelitis in monkeys.

The authors describe the method employed for the immunization of the horse and preparation and demonstration of the serum, as well as an analysis of a series of ten cases treated by intraspinal and intravenous injections of the immune serum produced by injections of the poliomyelitic coccus in sheep.

As a result of this study, the authors present the following summary of their work:

Of 159 patients receiving serum in all stages of the disease, 19 died, a mortality of 11.9 per cent. Among 100 cases occurring during the same period of time, in which the patients did not receive serum, 38 patients died, a mortality of 38 per cent.

Altogether, 152 patients in all stages of infantile paralysis were treated, excluding 7 cases presenting respiratory paralysis on admission with 11 deaths, a mortality rate of 7.2 per cent. During this same period of time a total of 301 cases were reported to the Health Department with 97 deaths, a mortality of 32 per cent.

This series of treated cases sufficed to demonstrate the harmlessness of serum treatment when the serum was free from hæmoglobin, sterile to repeated cultures, and the injections were slowly made and all known rules of precaution observed.

The serum appeared to possess the power of definitely preventing the onset of paralysis when administered early in the disease. In 10 undoubted instances of poliomyelitis in which no paralysis was detected at the time serum was administered, prevention of paralysis and complete recovery resulted in 100 per cent.

The action of the serum was more definite in arresting the extension of paralysis and diminishing the severity than in effecting its disappearance. As in other acute infectious diseases, the earlier the serum was administered, the more striking were the results obtained.

Serum should be injected intraspinally in small doses and at the same time intravenously in larger amounts. Temperature should be employed as a guide to the dosage. The injection of serum was followed by a critical fall in the patient's temperature. Coincident with this there occurred a slowing of the pulse-rate, and other definite clinical evidence of general improvement.

In doubtful early cases the decision to use serum should rest on the bacteriologic, chemical, and microscopic examination of the cerebrospinal fluid.

GEORGE E. BEILBY.

Wayson, N. E.: Prophylactic Use of Vaccines in the Great War. *J. Am. M. Ass.*, 1917, lxix, 267.

One of the precise aggressive weapons is that which gives rise to immune substances in the body, namely, the antigen. To conserve the immunogenic qualities of the organism involved and to institute the destruction of their infectivity has necessitated the use of dead or greatly attenuated bacteria. This has been variously accomplished by heating, by chemicals, chiefly phenols and ether, by autolizing, and by sensitizing with immune serum. The dosage in general vogue varies from 1,600 million to 4,000 million bacteria and the intervals vary from five to eight days. It is the opinion of several authors that three doses at most and frequently two inoculations are as effective as four or more.

There is a growing tendency to increase the initial dose, partly on account of the irregularities due to military exigencies, and partly on account of the results of experimental work which show that the success of the vaccination varies directly with the mass of the vaccine. The present practice is to revaccinate every eight to twelve months. The severe reactions, as well as the complications, can largely be avoided by attention to contra-indicatory signs such as fatigue, conditions prodromal to acute infections, and organic, respiratory, renal, or circulatory involvements.

There is now sufficient evidence to show that the morbidity and mortality are greatly decreased where protection is not afforded by the vaccination. The modification of the course of these intestinal infections has produced many "carriers" and has thereby created an additional problem for both military and civil communities.

The method of triple immunization in cases of typhoid and paratyphoid has been found efficient in the Japanese experience, and the reaction from the mixed vaccine is little greater that from the typhoid alone.

Anticholera vaccination has been administered in two doses and has been accompanied by less reaction than typhoid vaccinations. The immunity is more evanescent, necessitating re-inoculation in three to four months. Antidysentery vaccination, but slightly practiced, has given no convincing results.

GATEWOOD.

Culver, H.: Antibodies in Gonococcal Arthritis After the Intravenous Injection of Specific and Non-Specific Protein. *J. Lab. & Clin. Med.*, 1917, iii, 12.

Primary and secondary proteose preparations stimulate antibody production or mobilization for specific organisms in gonococcal arthritis in a manner not to be distinguished from that produced by the injection of the specific organisms themselves. In gonococcal arthritis there is either no change or a decrease in the antibody content of the serum within the first twenty-four hours following an intravenous injection except in the case of the first injection when the lytic substances seem to be slightly increased during this time.

In favorable patients the first injection usually causes the greatest clinical benefit. It would seem that there is no one particular factor which is responsible for the benefit derived in favorable patients, but a series of events occur which, when acting together or in succession, tend toward the relief and ultimate recovery of the individual from the infection. MAX KAHN.

BLOOD

Kerley, C. G.: The Treatment of Secondary Anæmia in Infants by Blood Transfusion. *Am. J. Obst.*, N. Y., 1917, lxxvi, 713.

The author reports eight cases of blood transfusion because of simple secondary anæmia or because of anæmia and malnutrition. The blood was usually obtained from the father or mother after physical fitness was demonstrated by the absence of agglutination and hæmolysis.

The technique was simple; blood was withdrawn from a vein of the donor into a syringe and injected directly into the vein of the infant. The syringe was washed out with sterile salt solution before being refilled with blood.

The results in all cases were satisfactory with one exception. In one case, a second transfusion was done, after a thirty-day interval.

The children were all under two years of age. Marked improvement in the digestive capacity and general health was noticed. W. L. BROWN.

Depage, A., and Govaerts, P.: The Hæmatologic Indications for Immediate Transfusion Following Injury (Les indications hématologiques de la transfusion immédiate dans les premières heures après une blessure). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 1874.

The authors made a systematic hæmatologic study of 47 cases of severe limb injuries, such as fractures, vascular wounds, etc. Thirty-two cases examined in the first six hours following injury showed more than 4,000,000 red globules per cubic millimeter of blood. By the third day the posthæmorrhagic anæmia reached from 2,400,000 to 3,000,000. Four of these cases died, 2 of acute infection, 2 from true hæmorrhage. Fifteen cases examined under aseptic conditions showed less than 4,000,000 red globules. Fourteen of these died from hæmorrhage in less than twenty-four hours.

The authors therefore conclude that it is a symptom of an almost surely fatal hæmorrhage if in the first six hours after injury the red count in the venous blood descends below 4,000,000. In such cases the injection of artificial serum is impractical, and under the circumstances a blood transfusion is absolutely indicated.

These results apply only to fractures. In visceral lesions there are other factors, and the results of blood analysis are more delicate. The figures apply only in the case of adults in good general condition, such as soldiers. The authors take the following as indicative of a severe hæmorrhage and calling for blood transfusion: less than 4,500,000 red corpuscles in the first 3 hours after injury; less than 4,000,000 red corpuscles in the first 8 hours after injury; less than 3,500,000 red corpuscles in the first 12 hours after injury.

The authors exhibit a tabular statement of 14 cases treated by transfusion. Three of these patients died from acute infection which had set in shortly after injury. Among the 11 others there were 8 complete successes. One of the failures was due to hæmoglobinuria and the two others were due to an insufficient amount of transfusion. In desperate cases this quantity should be doubled.

W. A. BRENNAN.

Saneyoski, S.: The Viscosity of the Blood in Experimental Anæmia (Ueber Blutviskositaet bei der experimentellen Anaemie). *Mitt. a. d. med. Fakult. d. k. Univ. zu Tokyo*, 1917, xvii, 401.

Subcutaneous injections of phenylhydrazin were made in rabbits for the purpose of producing anæmia and studying the viscosity of the blood and its effects. The author finds as the result of these experiments that though the blood viscosity fluctuates principally according to the number of blood corpuscles and the hæmoglobin and gas contents, yet high viscosity values occur during anæmia with relatively few number of blood corpuscles and small hæmoglobin content. This relative increase in the blood viscosity is especially noticeable in rabbits rendered anæmic with phenylhydrazin.

One of the principal causes is a certain substantial change in the erythrocytes. The change is demonstrable from the sediment in hæmolysis and from the marked tendency of the erythrocytes to appear agglutinous in progressive anæmia.

Cases exist, moreover, where the plasma viscosity, which as a rule is almost constant, is increased, causing in turn a distinct increase in the total viscosity of the blood. Finally, cases occur where the total viscosity is increased though neither erythrocytes nor plasma have had any influence upon the viscosity increase.

Whether the viscosity increase is to be considered as a real compensatory process in the mechanism

of the circulation disarranged by the anæmia or merely as an accompaniment of other important symptoms of anæmia cannot be definitely stated.

The impression is given that the organism undergoes no decided deviation from the normal on account of the change in the blood viscosity. But the tendency is to obtain a return to normal viscosity as long as the organism possesses reactive force. This accords to a certain extent with the ideas of Trommsdorf, Heubner, Determan, etc., who have emphasized the importance of the degree of viscosity of the body fluids for the process of life.

W. A. BRENNAN.

Morse, J. L., and Wohlbach, S. B.: A Case of Pernicious Anæmia in a Boy of Eight Years. *Am. J. Dis. Child.*, 1917, xiv, 301.

The author presents in full the history of a boy eight years old, suffering from pernicious anæmia. The diagnosis seemed very positive, although no cause could be determined. Addison's disease was suggested by the discoloration of the skin, but the absence of a profound muscular weakness, normal systolic pressure and apparently elevated temperature, showed that there was no adrenal insufficiency. The pigmentation, moreover, could be explained as the result of blood destruction.

The enlargement of the heart, murmurs over the heart and in the neck, high pulse pressure and other evidences of aortic deficiency appeared not to be due to organic disease, but to muscular weakness and vasomotor insufficiency.

Necropsy was performed December 12. A detailed report of the findings justified the clinical diagnosis of pernicious anæmia. With the exception of round worms, which were found in the intestines, nothing was shown as a possible cause of the disease. It appears improbable that the worms were the cause of the severe anæmia. No ova were found in the fæces on repeated examination.

E. C. ROBITSHEK.

BLOOD AND LYMPH VESSELS

Alamartine, H.: Arterial Wounds Without External Hæmorrhage and Their Surgical Treatment (Les plaies artérielles sans hémorrhagie externe et leur traitement chirurgical). *Lyon chirurg.*, 1917, xiv, 687.

The arterial lesions observed in war may be placed in two categories: those in which considerable external hæmorrhage is immediately manifested, and those without external hæmorrhage, the so-called dry vascular injuries. The author deals with the latter variety, 32 cases of which he has observed and operated upon.

The author treats the pathological anatomy and physiology, the symptomatology and treatment at length. The clinical types are conformable to the anatomic types and are divisible into three groups: (a) those showing symptoms of arteriovenous fistulæ; (b) arterial wounds or arteriovenous wounds with diffuse hæmatoma; (c) traumatic aneurisms.

The 32 cases observed by the author comprised 6 traumatic aneurisms; 5 arteriovenous fistulæ; 21 arterial or arteriovenous wounds with diffuse hæmatoma. There were 30 recoveries, 2 deaths, and 3 secondary amputations.

The technique consists in ligature of the vessels above and below the injury, resection of the aneurismal sac or of the intermediate segment, evacuation of the hæmatoma, liberation of the nerves, etc. Each of these steps is described in detail.

The author emphasizes the necessity of early operation, which should be performed before the formation of an aneurism; the importance of the minor symptoms which often reveal the existence of a vascular injury; and the necessity of acting by direct operation at the site of the vascular lesion and not by a distant ligature.

W. A. BRENNAN.

Ochsner, A. J.: Varicose Veins of the Leg. *Surg. Clin. Chicago*, 1917, i, 917.

Ochsner performs the Nussbaum operation for the varicose ulcer. This is an incision that encircles the ulcer at a distance of 2 cm. from its margin; all veins are ligated and the incision united with horsehair sutures. Then the Mayo operation is usually performed. A small incision 6 cm. above the internal aspect of the knee is made, exposing the internal saphenous vein, ligating doubly, threading the distal end through a Mayo vein stripper, and forcing the vein stripper down the leg to the vicinity of the external malleolus. Here a small incision is made, and the vein which has been separated is removed.

In more severe cases especially if there are several masses of varicose veins along the anterior surface of the leg, it is necessary to make a long incision and dissect out the masses *en bloc*, all veins being ligated carefully.

As a further assurance that all the veins are divided, Ochsner does in addition the Schede operation, which is a spiral incision of the leg. All veins are ligated as they are divided. A bridge of skin of at least 3 cm. should be left between the spirals. All the incisions are then sutured, a snug bandage applied, and the leg kept in an elevated position of 45 degrees. After the wounds have healed, which requires about two weeks, the leg is encased in a Unna's paste cast. This can be left on for from six to fourteen weeks. In some cases in which the veins are not much enlarged but an ulcer is present, the limb is kept elevated and moist boric acid applications are made until the ulcer appears healthy, at which time a skin graft is done. Ten days or two weeks later a Unna's paste boot is applied, having a window at the site of the graft.

In other non-operative cases a paste boot is applied and renewed as necessary. The results are better than with the use of an elastic bandage.

J. J. KURLANDER.

Fiessinger, N., and Clogne, R.: The Proteolytic Power of the Normal Polynuclear Leucocytes of the Circulating Blood (Étude sur le pouvoir protéolytique des leucocytes polynucleaires normaux du sang circulant). *Ann. de méd.*, Par., 1917, iv, 445.

The proteolytic index of polymorphonuclear leucocytes has been studied but only with regard to the leucocytes contained in pus. So far as the authors know, a similar study has not been previously made with regard to the proteolytic power of normal leucocytes in the blood stream. The authors have made such a study and review their findings thus:

1. Whatever proteid matter may be used, when the emulsion of leucocytes has reached the boiling point, the amount of nitrogen-formalin produced is nil or is not enough to be taken into account.

2. The amount of amino-acids produced is proportional to the concentration in weight or volume of albumin in the proteid solution.

3. The amount of nitrogen-formalin produced is proportional to the number of polymorphonuclear leucocytes in the test tubes. The progression is not regular and is not so marked in strong concentrations as in weak concentrations. The amount of nitrogen-formalin varies in inverse ratio to the concentration of the leucocytes.

4. Proteolysis takes place progressively between the twenty-fourth and forty-eighth hours. Vapors of formaldehyde, toluol and chloroform do not interfere with the diastatic activity, as is the case when the emulsion of leucocytes has been kept for a long time in 90 per cent alcohol or when it has been heated above 60° C.

5. There is no appreciable change in the activity of the proteolysis during the period of digestion of the individual.

6. There is a considerable decrease in the proteolytic activity of leucocytes during the restoration stage in anæmia secondary to hæmophilia.

7. Tests show that the amount of non-coagulable substances increases proportionally to the number of leucocytes. W. A. BRENNAN.

POISONS

Scalone, I.: Some Cases of Malignant Non-Gaseous Gangrene (Note su alcuni casi di edema maliguo non gassoso). *Policlin*, Roma, 1917, xxiv, *sez. chir.*, 433.

From the Italian war front Scalone reports 5 personal cases of gangrene consecutive to gunshot wounds which do not correspond with the classic picture of gaseous gangrene. These are malignant œdematous cases which in the early stages show neither gas bullæ nor signs of gangrene. The five cases had certain similarities: (1) Severe infection developed in relatively slight injuries; (2) the wound in all cases involved the muscular tissues, producing severe bruising and injury; (3) the wound was necrotic, with detritus and putrid exudations; (4) œdema was the most constant and important symptom; (5) there was absence of the production of gas; (6) gangrene was not a constant symptom.

The œdema was hard and diffuse extending from the periosteum to the skin; the skin was of a whitish porcelain color. Gangrene was entirely absent in two of the cases and in one case was local and circumscribed. In all 5 cases death occurred suddenly after symptoms of heart failure; the condition, although grave, gave no previous indication of an impending catastrophe.

The author made bacteriological examinations in these cases and the findings appear to correspond to those described by Sacquepée as predominant in the special form of gangrene known as malignant gaseous œdema. Scalone describes the condition as an acute infection of malignant character with a fatal prognosis, the earliest manifestation of which is œdema. It cannot be considered as gaseous gangrene, and appears to be more nearly a white erysipelas. The term non-gaseous malignant œdema might justly be applied. Such cases are much less numerous than those which correspond to the classic gaseous gangrene; but the classification of gangrene should commence with this non-gaseous form. It is very probable that further investigation will show that a different microbic agent corresponds to the different clinical types of gangrene.

The author was able to save the life of one patient by an early amputation of the thigh. The other four patients died. In similar cases he recommends early amputation before the second or third day. Wide opening up and stripping of the wounds gives no result. W. A. BRENNAN.

Douglas, S. R., and Colebrook, L.: Studies in Wound Infections; the Growth of Anaerobic Bacilli in Fluid Media Under Apparently Aerobic Conditions. *Lancet*, Lond., 1917, cxciii, 530.

The author reports a series of experiments in which anaerobic organisms were grown under practically aerobic conditions. It has been known for some years that the addition of a piece of animal or vegetable tissue to fluid media has a beneficial action on the growth of anaerobic bacteria.

Tarozzi first pointed this out and used small pieces of kidney or testicle. Ori and Wrzosek used pieces of vegetable tissue. Wright and Dreyer used tubes of broth to which a piece of potato had been added previous to sterilization. It was found that anaerobes would grow, even if a stream of oxygen were passed through the fluid portion of the media. The general explanation given was that the animal or vegetable tissue contained some body which acted as a reducing agent.

The authors repeated the experiments and obtained the same results as other investigators, but they experimented further and found that anaerobes could be grown if carrot, cabbage, grapes or bran were added. It was thought that possibly some food substances such as vitamines might be given up which enabled the anaerobes to proliferate. To

verify this, experiments were made in which an alcoholic extract of bran was added to the broth both directly and with saturated filter paper. The results were conflicting, but it was found that the best growth was obtained where a considerable amount of the solid extract was added; growths equally abundant were found in the control tubes where untreated filter paper was added. The idea was then abandoned that the growth was due to any food substance.

A series of experiments was then carried out in which various inert substances were used instead of vegetable tissue: asbestos wool, cotton wool, lint, sponge, charcoal, chalk, cork, sand, cardboard, blotting paper, khaki cloth and a rusty nail. The results showed that any form of inert substance rendered the media suitable for the growth of anaerobic organisms without any further precautions; the explanation was that the organisms are lodged in the meshes of the inert substance and are there able to produce anaerobic conditions locally, the growth gradually extending through the substance.

Other experiments showed that the amount and consistency of the substance used has direct bearing on the growth. Proof was further made that the bacilli would also grow in fine capillary tubes. It was shown by the use of aqueous solution of methylene blue in glucose broth that anaerobic bacilli are able to absorb oxygen rapidly or else to produce a reducing substance. It was also found that anaerobic bacilli will grow more rapidly and also form a smaller implantation if in addition to the usual anaerobic conditions some porous substance is added. C. A. BOWERS.

Zinsser, H., and Parker, J. T.: Bacterial Anaphylaxis and Infection. *J. Exp. Med.*, 1917, xxvi, 411.

An analysis of bacterial anaphylaxis and its relation to the occurrences in the animal body during an infectious disease has been attempted. The authors showed that the sensitization of the tissues of guinea pigs, as indicated by the isolated uterus, required from three to five days even when passive sensitization was employed, and that conditions with bacterial sensitization were entirely analogous to those revealed for serum anaphylaxis by Dale and Weil. It became apparent that the sensitized uterus reacted not at all with whole bacteria or whole red cells; in other words, before reaction with sensitized organs took place an extraction or solution of the bacterial cell occurred. That bacteria would yield some of their substance to the circulating blood during the course of infection was expected, but it was definitely indicated by the complement fixations.

The mechanism of injury in the sensitized animal, or in the human being so far advanced in typhoid fever that antibodies have begun to develop, is in part one in which antigen derived from the bacilli and brought into suspension in the blood stream reacts with antibodies which are from the beginning or subsequently become integral parts of the cell protoplasm, the entire process taking place within the cell. This last point is indicated by the failure to sensitize by simply soaking the normal uterus in antiserum.

This, however, cannot be the entire story of injury. It is known that typhoid antigen injected into normal animals in moderate amounts will render them gradually sick and eventually kill them. Also, a sufficient amount injected into a normal animal will occasionally produce acute symptoms in every respect similar to the reaction produced in sensitized animals by smaller doses. The authors have shown that such acute symptoms in normal animals were not due in any degree to tissue sensitiveness, since even large quantities of antigen produced no response on the part of the normal uterus. They therefore consider reasonable the supposition that the injury, gradual or acute, in the normal animal is in no respect referable to tissue sensitiveness to the whole antigen, but rather must be referred to some series of phenomena which occur in the circulation. The acute shock of normal animals may possibly be due entirely to an intravascular reaction. Whether this reaction is one of antigen-splitting or of anti-enzyme removal is a point on which the experiments threw no light.

The authors have not succeeded in producing acute toxic symptoms either in the whole animal or in the isolated uterus by means of serum from animals acutely ill. This is eliminated as negative evidence inasmuch as the toxic substances need at no given time be present in the blood stream in sufficient concentration to render such an experiment successful. They are probably absorbed, and do their injury almost as rapidly as formed, an assumption which is based on the speed with which symptoms develop.

The gradual illness of the normal animal and the occasional acute shock of these animals may be based on entirely different mechanisms, the authors state; at least this possibility cannot be denied on the basis of any experiment which they have been able to devise. In both cases, however, in normal animals the condition seemed to be intravascular. And since the symptoms of acute shock which were produced in sensitized animals with moderate doses were also, though only occasionally, produced in normal animals with larger doses, the authors suppose that the poisons produced intracellularly in the one may be similar to those produced intravascularly in the other. It did not seem probable that the specific circulating antibodies were in any way sources of increased injury to an animal spontaneously infected with bacteria. If sufficiently powerful at the beginning they prevented tissue injury, first by increasing phagocytosis, then by producing intravascular agglutination, and finally even by removing a part of the antigen from possible reaction with the cell; though in this last respect, the experiments indicated that the antibodies functionated imperfectly. It is more probable that their chief protective action to the sensitized body lay in removing the whole bacteria from the possibility of

intravascular disintegration, which is prerequisite to anaphylactic injury of the tissues of the host.

Tentatively the authors summarize their opinion as to the occurrences in the typhoid-infected body as follows: Early injury was probably due to disintegration of part of the bacteria, in the course of which albumose-like bodies were liberated and following which intravascular reactions resulted in the formation of toxic substances, perhaps by some form of proteolysis. Since the accumulation of bacteria during these stages was relatively slight, this form of injury probably played little part in producing symptoms. The experiment by which acute injury was produced in the normal guinea pig by the sudden injection of several times the lethal dose of partly dissolved bacteria found no analogy in the spontaneously diseased body. At this time the tissues were not sensitive; but as antigen absorption progressed and the tissues were stimulated to react, sensitiveness developed which rendered them much more delicately amenable to injury by direct reaction even with small amounts of dissolved but otherwise unaltered antigen. This process was directly counteracted by circulating antibodies which tended to prevent the bacteria from yielding their antigen to solution by agglutination, by aiding phagocytosis, and to a slight extent even by neutralizing dissolved antigen.

It seemed probable that the symptoms which appeared as the incubation time ended were largely those due to cellular sensitization which probably began before any considerable amount of circulatory antibodies was present. The circulating antibodies seemed to have little or nothing to do with intravascular injury, the ferments responsible for this probably consisting of the non-specific proteases studied by Jobling.

Cure consisted of a gradual checking of growth and final destruction of the bacteria, and the consequent cessation of antigen liberation, but delicate hypersusceptibility persisted for some time after cure and immunity had been established. Just what the relation between tissue hypersusceptibility and immunity is remains a problem for further study. GEORGE E. BEILBY.

SURGICAL DIAGNOSIS, PATHOLOGY AND THERAPEUTICS

Pyman, F. L., and Wenyon, C. M.: The Action of Certain Emetine Derivatives on Amœbæ. *J. Pharmacol. & Exp. Therap.*, 1917, x, 237.

The authors draw attention to the fact that emetine has been largely employed for the treatment of amœbic dysentery and has proved to be of great value. It seemed possible to them, however, that some derivative of emetime or one of the other alkaloids associated with it in ipecacuanha might prove to have a relatively greater toxicity to amœbæ than the parent substance. This led to a preliminary survey of the relative action of the alkaloids of ipecacuanha and some of their derivatives on amœbæ, from which it was also hoped to find some relation between the chemical constitution and the amœbicidal action of these substances.

The amœbicidal action of these compounds was tested by incorporating their aqueous solutions in the medium upon which the amœbæ were inoculated. The medium was an agar mixture, Walker's medium, upon which the amœbæ grew luxuriantly when the drug was absent; the amœba was one which had been recovered from water and was of the amœba limax type.

In the first series of tests there was no inhibition of amœbic growth with a dilution of 1:100,000, but four drugs showed complete inhibition and one a partial inhibition with a dilution of 1:10,000.

In the second series the drugs used in the first series were again tested in addition to others. The results obtained divided the substances into three groups:

1. The salts of emetine, cephaeline, N-methylemetine, N-methylcephaeline and N-methylemetinemethene were approximately equally amœbicidal.

2. N-Methylemetine methochloride, rubremetine hydrochloride, the hydrochloride B, and noremetine hydrochloride were inferior to those of the first group in amœbicidal action.

3. Psychotrine sulphate was much inferior to the substances of group 2. GEORGE E. BEILBY.

Colcord, A. W.: The Treatment of Minor Injuries. *Internat. J. Surg.*, 1917, xxx, 312.

In the treatment of minor injuries, a rapid examination is made with a view to three things: (1) to stop hæmorrhage; (2) to combat shock; (3) to relieve pain. For the first the tourniquet or pressure bandage is used. The pain and shock may be relieved by one-fourth of a grain of morphine and one-sixtieth of a grain of atropin. If shock is very severe the patient is placed in a comfortable position on a well-padded operating table. External heat is applied. The wound is not touched, but is first covered with cotton or gauze wet with a 1:2,000 cyanide solution. Strict aseptic conditions are observed regarding instruments, hands, and gown. The skin around the wound is then scrubbed with sterile water and liquid soap, and all hair is shaved from the surface. Foreign bodies and all visible dirt are removed, bleeding vessels are ligated, and shreds of flesh cut away. The wound is then irrigated with hot, sterile water. After covering the field well beyond with sterile towels, the wound is sutured, drained if necessary, and covered with sterile cotton and bandages; if near a joint, a splint is applied. Dressing wet with Oschner's solution or Dakin's fluid is kept over the wound for a few days until all danger of infection is past. Where the wound is deep and large, Dakin's fluid is used according to the Carrel method.

Over six thousand consecutive wounds have been treated with Oschner's solution without infection. The author now uses Dakin's fluid almost entirely and the results are highly satisfactory.

If a finger is badly lacerated, Colcord advises the use of a wooden spatula splint. In the case of the hand, wrist or forearm, a woven wire splint or a white pine splint is advised and the whole forearm put in a sling. If the foot is badly lacerated, he uses a cotton splint; if the ankle, he uses a cotton or wire splint and elevates the leg. When a finger is badly crushed and it is feared that amputation may be necessary, he lays the mangled parts carefully in position on the forearm and splint, and applies constant wet dressings. He does not suture immediately, but keeps the part warm, and places the limb in a sling or puts the patient to bed with the arm on a pillow. He applies sutures from twenty-four to forty-eight hours after circulation is established, then amputates those parts where there is no circulation.

Colcord gives various methods in the use of suture material, together with some hints on bandaging and the treatment of special wounds.

E. C. ROBITSHEK.

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Marine, D., and Manley, O. T.: Transplantation of the Thymus in Rabbits; Relation of the Thymus to Sexual Maturity. *J. Lab. & Clin. Med.*, 1917, iii, 48.

The authors have attempted to obtain more definite data on the transplantation of the thymus and to study its behavior in relation to sexual maturity and breeding.

The thymus normally undergoes a striking atrophy or involution at puberty. It was well established by Paton and Goodall, Henderson, Calzolari and others, that removal of the gonads before puberty delays thymus involution; that thymus removal hastens sexual maturity in rabbits; and that animals allowed to breed show earlier thymus involution than those not so used.

In the authors' experiments, they removed all the main thymus mass, exposing the gland by splitting the sternum to the third rib except the upper portion of one of the cervical cornua, and transplanted small fragments of 2 to 3 cmm. into the subcutaneous tissue of the abdomen. Contrary to the conclusion of Renton that transplants in the subcutaneous tissues did not survive, they found that the thymus can be readily transplanted in this location in sexually immature rabbits. Whether the peritoneal or subperitoneal tissues are still more favorable, as some authors state, they have not yet determined.

As with the spleen, only autotransplants survived. Immediately after thymectomy, as above described, two autotransplants were placed in the subcutaneous tissue of the abdomen of each of 8 rabbits. Each rabbit was between three and one-half and four months old. Six of these rabbits were observed for three months, and the transplants examined directly at monthly intervals. Two females were kept with one of the males. Examination at the end of the first month showed that both were pregnant; this is earlier than rabbits usually breed. At the gross examination, the transplants in all three seemed negative, though the enlarging breasts made the examination unsatisfactory. One transplant area was removed from each and examined histologically. In one female, there was an active transplant, while in the other female and the male the transplants had undergone nearly complete absorption. Of the remaining five, two died before the end of the first month. The remaining three, two females and one male, had active transplants, the male and one female having large 4 cmm. transplants, showing clearly that growth had occurred.

At the beginning of the second month, the female with the large thymus transplants was bred, and at the end of the second month these transplants could not be found, though on account of the lactating breasts the examination was not satisfactory. The male with large transplants at the end of the first month had active transplants, possibly larger than at the first examination. The unbred female also had active transplants.

These preliminary experiments showed that in sexually immature rabbits, fragments of thymus autotransplanted into the subcutaneous tissue of the abdomen after thymectomy may survive and grow. There is clear though scant evidence in confirmation of the results of other observers that thymus removal hastens sexual maturity. The authors also think, as others have found, that utilization of rabbits for breeding hastens involution of the thymus. These experiments showed that this applies to the transplanted thymus as well, which suggests that a specific nerve influence is not essential for these involutionary changes.

GEORGE E. BEILBY.

Woglom, W. H.: Loss of the Power to Produce Sarcomatous Transformation in the Stroma. *J. Cancer Research*, 1917, ii, 471.

Woglom asserts that certain alterations which occasionally occur in the stroma of carcinomata are actually sarcomatous transformations. Like some other attributes such as keratinization, the power to induce sarcoma is not always a permanent possession of the carcinoma cell. This was first observed in the Flexner-Jobling tumor, an adenocarcinoma of the seminal vesicle of the rat, which cleared itself entirely of a sarcomatous portion between the fifth and eleventh generations, extending over a period of eight or nine years. Whether the power to produce sarcoma has been entirely lost cannot be determined as yet. Similar conditions have been found in tumors by other observers.

The author describes in detail a spontaneous tumor found in the left inguinal mamma of a mouse of unknown age. This neoplasm possessed and later lost the power of producing sarcoma. The original growth was removed and inoculated into young mice. The tumor developed in them was a carcino-

sarcoma, while the disc, removed from the spontaneous growth and examined microscopically in sections, showed no sarcoma; however, these sections represented only about a quarter of the whole tumor.

The neoplasm was an adenocarcinoma, more hæmorrhagic than the ordinary tumor, and had extremely scanty stroma. With a few exceptions the daughter tumors preserved the adenocarcinomatous type in the main up to the present time. Alveolar areas and keratinization occur with relative frequency. It is probable that about one-quarter of all the spontaneous mammary carcinomata in the mouse produce more or less keratin, although there is not enough data at present to draw definite conclusions. Only about 12 per cent of sarcomata in man involve keratinizing neoplasms. But human mixed tumors may occur in practically any part of the body and cannot be compared to that of the mouse, where carcinomasarcomata occur exclusively in the mammary gland.

The question arises whether mouse tumors containing keratin may not perhaps induce sarcoma development in their stroma more often than other types of carcinoma. L. R. GOLDSMITH.

RADIOLOGY

Kuegle, F. H.: The Uniform Standardization of Roentgenographic Technique. *Med. & Surg.*, 1917, i, 848.

The author believes that the lack of detail in roentgenograms is due to the fact that the image is not in focus. This viewpoint introduces a new idea into the science of roentgenography and challenges the generally accepted opinion that faulty definition is due to secondary irradiations.

Reasoning from the generalization that roentgen rays are subject to interference just as are ether waves of the visible spectrum, the focal spot in the Crookes tube is held to be analogous to the diaphragm in the camera obscura. It is then pointed out that whereas the minimum focal distance when using the pin-hole camera for photographing objects with reflected light is dependent upon diffraction, this does not obtain in roentgenography in which the image is produced by transmitted light.

The author states that a shadow may be considered sharply defined if its penumbra does not exceed a breadth of one-half millimeter. He then demonstrates that ether waves emanating from any given focal spot produce upon the photographic plate a shadow, a part of which is umbra, a part penumbra, and that the relative breadth and intensity of the umbra to the penumbra depend upon the following factors:

1. The size of the focal spot plus the evenness of the distribution of energy over its surface.
2. The focal distance.
3. The thickness of the part being roentgenographed.

Since these factors are subject to measurement, a geometric equation for approximately computing the minimum focal distance becomes possible. This is formulated by the author as follows: The distance from the focal spot to the proximal surface of the body being roentgenographed, represented by X, is to the thickness of the part as the diameter of the focus spot is to one-half mm., the penumbral focal spot shadow consistent with good definition. The sum of X and the thickness of the part constitutes the minimum focal distance which will insure the production of an image having sharpness.

The present requirements for the making of better roentgenograms by the rank and file of roentgenologists are summed up tersely as follows:

The accurate standardization of roentgen ray tubes in accordance to the size of the focus spot so that the roentgenologist may know for what particular type of work a given tube is adapted.

The use of intensifying screens for medium and heavy work which require a tube having an extremely fine focal spot to produce an image in sharp focus, this being economically necessary to conserve the tube and prolong its life.

The elimination of so-called rapid or flash shot roentgenography except for cases where speed takes precedence over fine shades of detail, since only tubes having a very broad focus spot can be energized safely with high milliamperage at the voltages required for such work. Gastro-intestinal roentgenography is listed under this heading.

The author concludes that if these principles were borne in mind by all roentgenologists, the inevitable result would be the uniform standardization of roentgenographic technique.

Pirie, A. H.: Shrapnel Balls; Their X-Ray Characteristics Compared with Bullets and Other Foreign Bodies. *Canad. M. Ass. J.*, 1917, vii, 778.

Pirie's analysis is based on a study of 10,000 X-ray plates made during one year at a hospital in France. Shrapnel balls were shown on 241 plates and bullets on 242. Pieces of shell casing, bombs, hand grenades, etc., were shown on 3,846 plates. In no case did a shrapnel ball pass entirely through the body as a bullet frequently does; they were in several instances stopped by the skin on the opposite side from the entrance. There was no instance of the fracture of the femur shaft or the penetration of the brain by a shrapnel ball. In one instance both tables of the skull were fractured and the ball remained in the bone.

Shrapnel balls are usually of lead, but balls of iron have been found. Differentiation is important if the projectile is to be removed by aid of the vibrator. The shrapnel fragments generally have smooth or rounded edges. If a bone is hit, dust-like particles are seen at the contact.

Pirie believes that the shattering of bone by bullets occurs at the point of exit rather than at the entrance. In soft tissue the wound of exit is larger and more ragged than the wound of entrance.

DAVID R. BOWEN.

Van Zwaluwenburg, J. G.: Greater Certainty in the Localization of Foreign Bodies in the Eye. *Am. J. Roentgenol.*, 1917, iv, 512.

After briefly reviewing the principles concerned in the localization of foreign bodies in the eye as revealed by the Sweet localizer, the author calls attention to various sources of error that may occur. These depend on (1) variations in the size and shape of the eye; (2) misrepresentations of the position of the marker with reference to the axis of the eye and to the surface of the cornea; and (3) changed positions in space held by the foreign body during the two exposures.

Relative to the first named, judgment should be left to the ophthalmologist who may have definite information derived from his clinical examination of the case to guide him in correcting this error. As regards the second, the author believes that fixing the patient's vision by directing the well eye upon a fixed point on the wall or ceiling, so chosen that the axis of the injured eye will have the proper direction, will correct the majority of those mistakes.

The third named is the commonest source of error. By a series of diagrams and mathematic computations the author shows how these errors can be minimized. This is brought about by the making of three routine exposures on the same plate, instead of the two usually employed. They should be made in this order: the tube in the caudad position for the first, cephalad for the second, and median for the third. This method, in addition to having all the advantages of the two-exposure method, enables the operator to prove the technical end of the work, to demonstrate the adequate fixation of the eye, or to obtain a fair approximation to the truth. It also provides definite solution in cases of multiple foreign bodies and in cases of unusual positions in and about the eye within the orbit. ADOLPH HARTUNG.

Houda, E. O.: Four Point Survey of the Localization of Foreign Bodies Without the Use of X-Ray Plates. *Northwest Med.*, 1917, xvi, 311.

The well-known method of fluoroscopic localization by triangulation is very practical; it depends solely upon the fluoroscope. Houda's method is generally described as the Thurston Holland method. It is the first step in the practical extraction of bullets used by Flint, who applies this diagram of the parts and the fluoroscopic markings upon a cross-sectional anatomy in order to determine his anatomical relations before operating.

The following brief extract from Houda's article describes the method: "These four survey points being located upon the skin, locate the common plane of two axial lines through an imaginary sphere. A cross section through this common plane would cut through the bullet at *X*. This common plane may be marked with silver nitrate to facilitate the extraction. Having fixed the four points and the common plane, the approximation of the depth at which the bullet lies is the final determination of this method.

"The two points which lie closest together determine the nearest approach to the bullet. The midway point between these two marks the basal point of the perpendicular of the lesser triangle. Considering the smaller base as one, the total of the ratios of the two bases gives the actual thickness of the limb. This must be so, since the ratios of the two perpendiculars are the same as the bases.

"If the upper base was one, the lower base three, the total of these makes the thickness of the limb four. The bullet lies at a depth of one-fourth of the thickness. Incision is carried down between the two points on the upper surface, which is a small base, in the common plane and a distance of one-fourth of the actual thickness of the limb. This method may be applied successfully to any part of the body." E. H. SKINNER.

McArthur, L. L.: Surgery of X-Ray Lesions. *Am. J. Roentgenol.*, 1917, iv, 521.

The author subdivides the roentgen lesions amenable to surgery into four groups: (1) keratoses; (2) acute burns; (3) chronic inveterate burns; (4) carcinoma developing in cicatrices or keratoses.

The first named, which according to Pusey are identical histologically with senile keratoses and like them meet with epitheliomatous degeneration, should be promptly removed and the skin defect covered by a Thiersch graft. This procedure has been almost uniformly successful.

In the case of acute burns, which occasionally persist and present a greyish-white diphtheroid ulcer with moist surface, if feasible the lesion should be excised and the skin edges undermined and drawn together. If impracticable, large well-fitting Thiersch grafts may be used with success. This is preferable if the skin surrounding the lesion is markedly impaired in vitality. The author's experience has demonstrated that such skin will not stand much tension on the sutures holding the edges together, but will cut through.

In chronic X-ray ulcers a similar procedure is followed. Carcinoma developing in cicatrices or keratoses is invariably of the squamous-celled type and is peculiarly prompt in involving the lymph glands. Its treatment, like that of ordinary carcinoma, consists in early removal of the lymph-nodes. ADOLPH HARTUNG.

MILITARY SURGERY

Plisson: A Mobile Surgical Unit (Un groupe chirurgicale mobile). *Bull. Acad. de méd.*, Par., 1917, lxxviii, 362.

The object in view is to provide at the front a uniformly constituted surgical unit having all the surgical necessities for the immediate treatment of the wounded. This requires an antonomous, mobile, interchangeable formation.

The surgical group should be composed of complete and independent divisions in order that enlargement or curtailment of these may increase or

diminish the total capacity without altering the fundamental structure of the whole unit.

This surgical unit as designed has been put into effect at the front by the French service. Each unit consists of three distinct sections: an operative section, a hospital section, and an administrative section.

The operative section has five motor wagons, one for sterilization, one for surgical material, one for radiography, one fitted for operations, and one for pre-operative work. The light is furnished by the first wagon generated from the motor and distributed by connections.

The hospital section theoretically provides 100 beds. There are five divisions of 20 beds, each division being complete in itself.

The administrative section carries food and a kitchen, etc., for the personnel. The whole unit has its central station around which it is grouped. The sections are such that each may be independently increased or diminished according to necessity without altering the structure of the whole group.

This surgical unit fulfils the object of being antonomous and mobile. It is adaptable either to stationary warfare or moving troops and may be extended to meet the requirements of the work to be done. Quénu states that he has visited one of these formations, examined it in every detail, and was most favorably impressed. W. A. BRENNAN.

Roussy, G., and Lhermitte, I.: The Hemiplegic Form of Direct Shock of the Cervical Cord with Lesion of the Eleventh Cranial Pair (La forme hemiplégique de la commotion directe de moelle cérvicale avec lésion de la onzième paire cranienne). *Ann de méd.*, Par., 1917, iv, 468.

In shell shock producing brain concussion the occurrence of an anatomic lesion is exceptional. This is not the case in spinal cord concussion. The concussion in this case is the jarring of the cord due to a traumatism either of the spine itself, of its bony appendages, or of the muscles which are inserted in it. This direct concussion differs much from contusion, attrition or wounds of the spinal cord. Besides such direct concussion there is an indirect concussion of the cord caused by shell shock, in which case the individual is not struck by any solid body. Such cases are, however, rare.

The authors report four cases which are very similar to each other and are of a new form and clinical type, i.e., spinal hemiplegia which does not show the Brown-Sequard syndrome, but which is associated with a direct lesion of the external branch of the spinal nerve. This lesion is the cause of an amyotrophic type of paralysis of the sternomastoid and trapezius muscles, with reaction of degeneration of the atrophied muscles which may be complete or incomplete. Sometimes fibers of the cervical plexus are involved in addition to the eleventh cranial nerve. The lesion is also the cause of sharp pains in the corresponding side of the neck as well as of anæsthesia or hypæsthesia in the painful area.

Hemiplegia appears after a few days when other symptoms due to concussion of the spinal cord have subsided. It does not remain complete very long; gradual recuperation is observed, at first of the lower, and later of the upper limb.

In one of the authors' cases there were subjective symptoms of sensory disturbance, pains in the paralyzed side of the body which were provoked by the slightest touch. These pains were quite different from the excruciating and tenacious pains observed in cases of concussion of the cervical portion of the spinal cord causing brachial diplegia. In this latter case the pains are localized in the area corresponding to the superior roots of the brachial plexus and are due to their involvement. In the former case the spinal cord alone is involved. In the first case there are objective signs of sensory disturbance; in the second there are none.

Other disturbances due to the concussion can be observed in these cases of spinal hemiplegia, such as vasomotor, sudoral, and thermal disturbance. Amyotrophia, involving the whole paralyzed side of the body, sometimes appears at an early date.

Hemiplegia as well as quadriplegia and monoplegia due to concussion has a favorable prognosis as regards life and often ends by a complete restoration of functional efficiency. This possibility is due to the fact that the lesions due to concussion chiefly involve the axial fibers. Thus in even apparently serious cases of concussion of the spinal cord there is the possibility of very satisfactory if not complete restoration. W. A. BRENNAN.

Goldthwait, J. E.: The Place of Orthopedic Surgery in War. *Am. J. Orthop. Surg.*, 1917, xv, 679.

The article deals with the conspicuous position which orthopedic surgery occupies in this war and states that much of the work that is now being developed is bound to be preserved to meet the civil needs when the war is over. In England, the work has been directed by Jones, who was formally appointed Inspector of Military Orthopedics in March, 1916.

Later an official classification was prepared of the conditions to be considered orthopedic. These are as follows:

1. Derangements and disabilities of joints, simple and grave, including ankylosis.
2. Deformities and disabilities of the feet, such as hallux valgus, hallux rigidus, hammer toes, metatarsalgia, painful heels, flat and claw feet.
3. Malunited and ununited fractures.
4. Injuries to ligaments, muscles, and tendons.
5. Cases requiring tendon transplantation or other treatment for irreparable destruction of nerves.
6. Nerve injuries complicated by fractures or stiffness of the joint.
7. Cases requiring surgical appliances.

The magnitude of the problem is shown by the fact that from 30 to 50 per cent of all injuries require orthopedic treatment. When it is realized

that in the British Isles there are about 310,000 military hospital beds, apart from the 120,000 beds for British forces in France, the importance of the position can be appreciated. The responsibility has been still further increased by the fact that the problem of handling the limbless has been turned over to the orthopedic department.

At present there are 10,000 purely orthopedic beds under the direction of the Inspector, but at least ten times that number are required if the need is to be fully met.

Expansion of the service demands the securing of properly trained men for the staff. So much is expected from the orthopedic department that only men who are thoroughly trained can be considered, and they must be willing to serve reasonable periods of observation and instruction before they can be considered competent.

The hospitals are fully equipped with operating rooms, X-ray service, etc., and also have well-equipped departments for electrotherapy, hydrotherapy, massage and special exercise both passive and active. Equally valuable are the so-called curative work shops. The shops furnish a physiological and psychical stimulation to the patient. The occupation is selected and a special part chosen with reference to the particular need of the individual. For instance, in the case of a stiff wrist and poor circulation in the hand, work with a carpenter's plane will utilize the fingers as well as the wrist.

In regard to the limbless the duty of the orthopedic surgeon is to prepare the stump for the artificial member and to see that the adjustment is satisfactory. It is of the utmost importance that the joint above the amputation should have the normal range of motion, a fact which rarely exists as the patients are turned over to the artificial limb-makers.

The author presents figures showing the great value of expert orthopedic service in returning not only to useful civil life but to the army men who would otherwise be hopeless pensioners.

This work insures to the men not only the saving of life and the healing of wounds, but useful functioning in the damaged part. It is hoped that the necessary readjustment of American institutions will be made to meet this need in the civil accident.

The inadequacy of present hospital methods makes it quite obvious that after the war permanent, fully equipped orthopedic centers will be depended upon to save the many men who are being crippled by industry or disease.

The training which the orthopedic men of this country are receiving in the orthopedic centers of England will be of inestimable value in preparation for this future need, as well as for the more immediate need of caring for American wounded soldiers. PHILIP LEWIN.

HOSPITAL, MEDICOLEGAL, AND MEDICAL EDUCATION

Lyon, E. P.: Graduate Education in the Clinical Branches and the Minnesota Experiment. *J. Am. M. Ass.*, 1917, lxix, 1307.

The necessary technical processes of medical science have become too complex and numerous for one man to master. Division of labor or specialization is advantageous and unavoidable, and makes for better practice and for surer progress. Systematic graduate training in the clinical specialties, including advanced work in the underlying sciences, is a necessity.

The safeguarding of the public demands some method of certification for specialists. This is, perhaps, quite as important as the primary certification or licensure. How is the average citizen at the present time to proceed in order intelligently to select a competent surgeon?

The progress of medical science is of the utmost importance alike to the needs of the individual, to progressive civilization, and to the profession of medicine.

The leaders of medicine as exemplified by the class of specialists should be more than practitioners. They should be scientists. More rigid scientific preparation on the part of all physicians is needed, but particularly on the part of investigators.

These needs involve a task appropriate to a university. The practical question arises as to the extent to which a given university may undertake this work in medical specialization. The University of Minnesota is making an experiment in this connection. Their requirements are as follows:

1. For acceptance as a medical graduate student: (a) a bachelor's degree or its equivalent, which may have been obtained in a combined B.S. and M.D. course; (b) an M.D. degree from a good school; and (c) a year's interneship in an approved hospital.

2. For the advanced doctor's degree: (a) at least three years of graduate study distributed chiefly between a major subject and one or two supporting or minor subjects; (b) a reading knowledge of German and French tested by special examination; (c) an acceptable thesis, which must contain the results of original investigation; and (d) final written and oral examinations before committees of the graduate faculty.

The graduate work is done in connection with the Mayo Clinic. EDWARD L. CORNELL.

GYNECOLOGY

UTERUS

Lindquist, L.: Results in Two Hundred and Twenty-One Cases of Laparotomy for Myoma (Redogorelse for en serie av 221 myom laparotomie). *Hygiea*, Stockholm, 1917, lxxxix, 625.

Lindquist gives a detailed tabular statement of 221 cases of uterine myoma in which he operated. These cases cover a period of eighteen years.

The operations performed were as follows: supravaginal amputation of uterus, 121 cases; total extirpation, 65 cases; enucleation, 16 cases; enucleation plus extirpation, 7 cases; extirpation, 12 cases.

One patient died after total extirpation and one after supravaginal amputation; both deaths were due to pulmonary embolism. This gave a post-operative death rate of 0.9 per cent. Disturbances followed in 45 per cent of the cases after artificially induced menopause. The rate was 41.6 per cent in cases where one ovary was left as against 51.6 per cent where both were removed. The final results were excellent in 94.2 per cent of the total extirpation cases and in 81.1 per cent of the vaginal amputations. Malignant degeneration was observed in 14 cases. Seven of these are still living, one of them for more than seven years since operation and 2 for more than three years. One died from other cause than recurrence after four years.

Despite the apparent statistical advantage of hysterectomy over the supravaginal amputation, the author prefers the latter, and continues to employ it whenever suitable. W. A. BRENNAN.

Novak, E.: The Organotherapy of Menstrual Disorders. *Bull. Univ. Md. Schl. Med.*, 1917, ii, 113.

After a review of the probable interrelationship between the internal secretory glands and the female generative apparatus, Novak enumerates the gland substances most commonly used and points out the types of menstrual disorders in which organotherapy is indicated.

These types, as the author has arranged them, are as follows:

1. Uterine bleeding without apparent cause, at or near the menopause.
2. Amenorrhœa in young girls, the so-called "functional amenorrhœa of puberty."
3. Amenorrhœa of later life, frequently caused by obesity and sexual hypoplasia.
4. Menorrhagia and metrorrhagia at puberty where there exists no definite pathological lesion.
5. Primary dysmenorrhœa.

The author prefers to look upon organotherapy as a species of drug treatment which is, therefore, not usually specific, but effective as an adjuvant in the treatment of a given disease. Viewed from this angle, and considering the lack of any certain knowledge regarding their therapeutic indications, the results so far obtained by the administration of the organic extracts are certainly not discouraging. H. B. MATTHEWS.

Collins, C. U.: A New Operation for Prolapse of the Uterus. *Tr. South. Surg. Ass.*, St. Augustine, 1917, Dec.

This operation is presented for the relief of complete prolapse of the uterus in which the ligaments have lost their elasticity and the uterus remains permanently outside the vulva.

A Pfannenstiel incision is made, and a transverse strip of aponeurosis one-fourth of an inch wide is cut from the upper edge, leaving the two ends normally attached. A supravaginal hysterectomy is done and the strip of aponeurosis is laid in the cervical trough and the cervical edges or flaps are sutured over it.

The advantages over Kocher's operation or Murphy's modification are that no large pieces of uterine tissue are left in the abdominal wall, and its suspending power does not depend on adhesions between dissimilar structures such as uterine tissue to muscle and aponeurosis. The cervix is held by the strip of aponeurosis, normally attached at each end, which will not give or stretch, and by the union of dense cervical tissue over this strip.

Montgomery, E. E.: Choice of Operation for Retro-Displacement. *N. Y. St. J. Med.*, 1917, xvii, 437.

Retrodisplacements may exist for a long time without causing symptoms, but the author believes this is no argument against the correction of displacements, as the position interferes with the return circulation through the veins, and the uterus becomes larger from passive congestion. Its drainage is less effective and its resistance to possible infection lowered.

In a recently confined case mechanical means for holding up the subinvoluted organ until involution is completed are justifiable. In a young growing girl, in whom mechanical means are not advisable, much may be done by deep breathing in the knee-chest position, regulation of the bowels and bladder, and avoidance of tight clothing. The erect position should be assumed while sitting, and the lateral and prone positions in bed. Swimming is an excellent exercise for those with a tendency to retrodisplacement.

The recognized inefficiency of the pessary as a curative agent has led to a search for more effective

measures. Montgomery reviews the various surgical procedures of shortening the round ligaments, ventrosuspension and fixation, shortening the utero-sacral ligaments, and he states the objections to all of these. The most satisfactory procedure is a modification of the Gilliam operation, which he performs as follows:

After opening the abdomen, breaking up adhesions and treating any abnormal condition of the tubes or ovaries, a ligature is carried under the round ligament one and one-half inches from the cornu. The ends of the first ligature introduced are secured by a hæmostat, and the ends of the second threaded into the eye of a modified Deschamp needle.

The round ligament is caught with a hæmostat external to the point at which the ligature passes beneath it. An incision is made in the anterior surface of the broad ligament, and the needle, threaded with both ends of the ligature, is carried outward between the layers of the broad ligament until it reaches the point at which the peritoneum is reflected upon the anterior abdominal wall. Here it is brought through the aponeurosis and its ends secured with a hæmostat which has been removed from the round ligament. The same course is pursued on the opposite side.

Then holding the ligature tense, a pair of closed scissors is passed along it through the aponeurosis, the blades slightly separated and withdrawn. Traction upon the ligaments usually brings through the loops without difficulty.

Each loop is then secured on either side by a suture, which includes the distal and proximal portions of the loop and a portion of the aponeurosis. The loop can be drawn out or relaxed so as to permit the necessary traction upon the uterus.

Montgomery has performed the operation alone or combined with other operations 896 times, with 6 deaths in the entire series.

This operation utilizes the best part of the ligament to hold the uterus forward, it creates and leaves no raw surface for subsequent adhesions, leaves the uterus movable but incapable of being displaced into the retro-uterine pouch. It leaves the ligaments capable of evolution and involution. It is applicable to difficult as well as simple cases, but will not cure all conditions.

When prolapse is associated with the displacement, the cervix should be drawn upward and backward, and in addition the operation should be associated with restoration of the pelvic floor and occasionally shortening of the uterosacral ligaments.

L. R. GOLDSMITH.

ADNEXAL AND PERIUTERINE CONDITIONS

Jack, H. P.: Conservative Surgery of the Fallopian Tubes. *N. Y. St. J. Med.*, 1917, xvii, 443.

The author discusses the advisability of less radical treatment of infected tubes and declares there is a justifiable tendency toward conservatism in this field of surgery. He doubts whether patients with infected tubes are given a fair opportunity for maternity, and suggests the possibility that a future co-ordination of gynecologists along conservative lines might result in the restoration of a larger number of women to a condition in which pregnancy might with reasonable possibility occur. He quotes from recent literature which states that the uterine end of the tube is seldom, if ever, closed. Nature shows a wonderful recuperative power in the tubes, pregnancy having been reported after ligation and resection and in one case, reported by Webster, the fimbria had re-formed at the end of the stump. Sterility is obtained with certainty only when the stump of the tube is peritonized.

Cases selected for conservative work should be under thirty-five years of age. The history of gonorrhœa or other infection should be clear and not less than from six to twelve months old, the gonorrhœal pus being usually sterile by this time. The lesion should be located under anæsthesia, during which examination the stigmata of gonorrhœa should be sought and noted.

Red spots at the duct openings give presumptive evidence of bartholinitis, and the lesion located in the tube indicates gonorrhœal rather than puerperal infection, the lesion in the latter case being usually in the parametrium.

As to technique, the most gentle handling of tissues and the separation of adhesions under light is necessary. The author reviews the technique of Salatich, Childs, Stone, Turk and others, the essential part of which, in addition to the freeing of adhesions and the disinfection of the actual field by preliminary dilatation of the cervix, consists in swabbing out the uterus with 25 per cent tincture of iodine in alcohol and then forcibly injecting the same solution through the remnant of the tube down through the uterine cavity.

Jack's own contribution to the technique is the use of probe-pointed scissors in splitting the stump of the tube; these are especially useful where this step is particularly difficult on account of the extreme shortness of the stump. After splitting the tube, the mucosa is united to serosa and the everted split ends sewed to an ovary or the remains of one.

As yet, none of the ten cases which he has operated have borne children; the cases reported by the other men, however, are sufficiently encouraging to warrant continuing this conservative treatment, especially since serious postoperative results are not to be feared.

L. R. GOLDSMITH.

Butt, J. W.: A New Treatment of Acute Salpingitis. *J. Ark. M. Soc.*, 1917, xiv, 105.

Butt recommends the use of dehydrated magnesium sulphate in the vagina for the relief of acute salpingitis. Through a bivalve speculum one-half ounce of magnesium sulphate which has had the water of crystallization driven off by heating is put against the posterior wall of the vagina and held in position by a tampon of absorbent cotton. This procedure is repeated every twenty-four

hours for a period of time varying from six to twelve days. Rest, a light diet and a saline laxative are given.

The rationale of this procedure, according to the author, is explained by the fact that "magnesium sulphate acts as a dehydrating agent which relieves the pain by lessening the tension of the exudate both in the fallopian tubes and the pelvis." The author has used this form of treatment in 15 cases of acute salpingitis, and while he cannot assert that it cures salpingitis, he believes that it does relieve the acute attack. H. B. MATTHEWS.

Miller, C. J.: Ligation or Excision of the Pelvic Veins in the Treatment of Puerperal Pyæmia. *Surg., Gynec. & Obst.*, 1917, xxv, 431.

Miller reviews the history of this method of treating puerperal pyæmia. In the other forms of puerperal infection, the tendency has been to abandon active surgical interference and to depend upon expectant treatment, this course being justified by experience.

In the pyæmic form, however, no method of treatment has reduced the mortality to any degree. The gaping veins at the placental site offer the most favorable opportunity for blood infection. If the invading organisms are highly virulent, a severe bacteræmia or peritonitis results before local processes may bar their advance; such cases are doomed from the beginning and death occurs with little if any local evidence of disease.

In cases with greater resistance or lesser bacterial virulence, protective thrombi may form in one or more of the pelvic veins. The infection may then become limited or the thrombi may extend and cause death by involvement of the larger venous trunks. More frequently the thrombus undergoes liquefaction and liberates septic emboli, which carry infection to remote areas and establish metastatic foci, or abscesses.

Hunter in 1784 successfully treated a case of pyæmia by ligating the saphenous vein and Zauful in 1894 was likewise successful in treating pyæmia of otitic origin by ligating the jugular. This principle was not applied in obstetrics, however, until 1902, when Bumm and Trendelenburg published their results in the treatment of puerperal pyæmia, the latter attacking the veins extraperitoneally, the former by the transperitoneal route.

In estimating the value of this treatment, four phases of the subject must be considered:

1. Can septic thrombophlebitis be recognized with sufficient accuracy to justify a serious operation?
2. Do the pathological conditions found at operation or autopsy justify intervention?
3. What are the indications for operation?
4. Has the mortality been reduced by operation?

In reply to the first question, while American obstetricians are skeptical as to the feasibility of diagnosis, those in Germany insist that it is possible in the majority of cases, differing however as to how early a diagnosis can be made. Chills are the most important symptom but they are variable as to type and time of occurrence and may even be absent.

In some cases, 80 per cent, according to Lenhartz, the thrombosed veins can be palpated as worm-like masses high up in the outer portion of the broad ligament or along the spermatic veins. They are easily confused with pyosalpinx and parametritis, both of which present, as a rule, a more persistent temperature, with less tendency to recurrent rigors, and considerable pain.

Absence of pain is the rule in thrombosis, though it may be present in the beginning. The broad ligament is not fixed, as in cellulitis, nor does the mass approach the pelvic wall, as in simple exudates. Blood cultures are of little value.

In a case presenting high temperature, with marked remissions, without pelvic exudates or peritonitis, the uterus empty and correspondingly involuted, the diagnosis should not be difficult.

The frequency of the affection should be of some diagnostic value; a condition found in one-third to one-half of all women dying of puerperal infection should emphasize the probability of its presence in a given case.

With regard to the second question, pathological findings at operation or autopsy are a practically normal genital tract with the exception of thrombosed ovarian veins. A few cases show involvement of the lymphatics in addition.

While different veins may be involved, analysis of 100 cases shows: one spermatic, 75 times; both spermatic, 5 times; one hypogastric, 6 times; one hypogastric and one spermatic, 6 times; one common iliac, 8 times.

These findings are those obtained at operation, not at autopsy, when the thrombosis is usually much more extensive. This tendency of the process to primarily affect only one or two veins is a very strong argument for surgical treatment.

Some oppose intervention on the ground that the thrombosis is a protective process and that there is always a septic endometritis present, and that ligating or excising individual veins will not close all the avenues to the blood stream.

These arguments are answered in that a thrombosis is no longer conservative when it begins to liquefy and discharge septic emboli into the circulation; and furthermore, that the patient can usually withstand a septic endometritis if the veins do not become thrombosed and discharge infected emboli.

The principle underlying ligation of infected veins is the powerful resistance offered by the vessel wall to streptococci. It is a considerable obstacle to the highly virulent and an almost insuperable obstacle to the benign streptococci. Such a degree of resistance is possessed by no other tissue, and since a single vein is involved in most instances, it would seem a further proof that surgical intervention is a rational procedure.

Regarding the third question, the time to operate

is still a matter of discussion; some advise operation after the first chill; some not until the thrombosed veins can be palpated. The acute stage, during which general toxic symptoms predominate, lasts from eight to ten days, after which localization in the veins takes place and the constancy of symptoms becomes more decided.

Of the cases collected, the recovery statistics are better for those operated in the first and fifth weeks, though Venus had 53.8 per cent recoveries in those operated upon in the first two weeks and 42.8 per cent in the second two weeks. One reason for early operation is to prevent extension of the thrombus into the cava.

Operation is futile in cases showing evidence of peritonitis, broad ligament abscesses and multiple metastatic abscesses; acute endocarditis, pulmonary abscess or pneumonia usually indicate general pyæmia and contra-indicate operation.

As to technique, in view of the location of the thrombus and incidental complications, the transperitoneal method is the only one to be considered. In pure thrombosis, ligation is sufficient. Excision is indicated when there are periphlebitic processes or when the vein presents areas of softening which appear likely to perforate. Warnekros urges ligation of the common iliac in thrombosis of the deep veins and believes that in extensive thrombosis the cava can be tied without fear of gangrene.

As to the fourth question, the lowering of mortality by operation, it is generally settled that the average death rate is between 60 and 70 per cent. Of the operated cases, excluding those with cava thrombosis, the mortality was 51.6 per cent. Eliminating all the other hopeless cases, some of which were practically autopsies, as those with acute peritonitis, faulty ligation of the vessels, broad ligament and multiple metastatic abscesses, all of which are distinct contra-indications to operation, the mortality is reduced to 33.9 per cent.

The author appends the summaries of the 197 cases recorded in literature, this being the list published by Williams in 1909 and his own addition of the cases reported since. L. R. GOLDSMITH.

MISCELLANEOUS

Stevens, W. E.: Etiology and Treatment of Frequency of Urination in Women. *N. Y. M. J.*, 1917, cvi, 630.

Frequency of urination in women is often carelessly and unscientifically treated after a cursory examination is made to ascertain its etiology. The use of the endoscope, the cystoscope, ureteral catheters and the microscope are essential for accurate diagnosis, and should be preceded by a careful examination of adjacent abdominal and pelvic organs and accessory glands. Radiography and functional kidney tests are often required. For the latter, the intravenous phloridzin test has proved most helpful to the author, especially when the amount of urine is small and contains blood.

Pathological conditions of the urethra, bladder, ureters, kidneys, vagina, uterus, fallopian tubes, ovaries and rectum as well as general conditions such as diabetes, highly acid or alkaline urine, oxaluria, ptosis of the abdominal organs and central nerve lesions have been found responsible for this symptom. The most frequent cause is trigonitis associated with urethritis; pyelitis ranks next in order. A common factor, scant mention of which is found in the literature, is prolapse of the posterior urethral wall.

The treatment of trigonitis and urethritis which has proved of most value is the application of a two to ten per cent solution of nitrate of silver. Pyelitis is best treated by drainage through the ureteral catheter which may be left in position for a period of from two hours to several days. This, together with the production of a decided change in the reaction of the urine by means of acid sodium phosphate, sodium benzoate or potassium citrate, which inhibits the growth of the offending bacillus, usually results in recovery. Prolapse of the posterior urethral wall is best corrected by operative procedure.

In view of the numerous causes of this complaint, hasty conclusions should not be drawn as to its etiology, and treatment should be instituted only after a careful examination.

Watkins, T. J.: Radium in Hæmorrhage at the Menopause. *Surg. Clin. Chicago*, 1917, i, 1031.

In the first case reported by the author, the patient, aged fifty, suffered from persistent menorrhagia of the menopause after a vaginal fixation done seven years before. Under nitrous oxide the patient was curetted, but nothing abnormal was found. Fifty mg. of radium were inserted into the uterine cavity, the radium screened by one mm. of gold covered with rubber, and left in place for twenty-four hours. Slight bleeding followed for a week. Three months later the uterus was atrophied; the general condition was excellent. The radium had acted on the graafian follicles and produced definite changes in the endometrium and in the blood-vessels of the uterus.

In the second case, the patient, aged forty-seven, suffered from excessive menstruation. The uterus was large but showed no neoplasms. Twelve hundred mg. hours of radium were used. Six months after application the bleeding had been entirely stopped.

The radium element is in a small glass capsule; this is enclosed in a silver capsule and placed in a small gold capsule which is covered with rubber. To this a cord is attached to guard against losing the radium. It is introduced with the greatest aseptic precautions. A capsule of fifty mg. radium is left in place for twenty-four hours, i.e., twelve hundred mg. hours.

There is no pain from the use of radium. Slight nausea, vomiting, and a feeling of exhaustion are present for two or three days. Bleeding may persist for a few days following the use of radium, and

leucorrhœal discharges are often increased for two or three weeks. One menstrual period may occur after the use of radium.

This method will probably diminish considerably the hysterectomies done for menorrhagia occurring at the menopause and for persistent menorrhagia that not infrequently follows the operation of vaginal fixation. S. W. BANDLER.

Delacroix, I. A. B.: Gangrene of the Extremities Consecutive to Gynecological Operation and Puerperium (Gangrene de las extremidades consecutiva a operaciones ginecologicas y al puerperio). *Thèse de doct.*, Buenos Aires, 1917.

Various aspects of gangrene following gynecological operations and the puerperium are discussed. Stein in 1916 collected 76 cases from literature, including 63 cases of peripheric gangrene consecutive to labor; 5 cases after abortion; 4 cases as complications of pregnancy.

The author considers the condition according as the obstacle to the circulation may cause (a) gangrene of arterial origin; or (b) gangrene of venous origin. The various theories put forward by different authors are reviewed and discussed.

Delacroix gives the details of a case following an operation. The patient was a woman of thirty-five years on whom a subtotal hysterectomy had been done for intraligamentous fibroma with double adnexitis. One month and a half later she left the hospital at her own request with a small fistula which persisted. She returned a month later in a very bad condition and unable to walk. The wound was open and discharged a quantity of dark serous exudate. In the region of the left ankle there was a necrotic area about 20 by 10 cm. in size. The right extremity was similarly affected but to a lesser extent. Her condition rapidly became worse and the woman died after a few days. There was no autopsy.

The determining causes of the gangrene in this case, the author believes, are operation and infection acting in conjunction with a predisposing condition of organic debility. In the absence of autopsy it cannot be stated what type of gangrene occurred, but its development in corresponding areas suggest an arterial origin. Infection probably penetrated into the uterine artery sectioned during the operation, and by extension and formation of coagulation succeeded in occluding the primary iliac on one side; then continuing its extension, reached the aortal bifurcation and occluded the primary iliac of the opposite side. W. A. BRENNAN.

Walters, F., A.: Gynecology in General Practice. *Clinique*, Chicago, 1917, xxxviii, 372.

The author states that exposure to the elements at or during the menstrual period often causes an engorgement of the pelvic organs or produces a relapse in patients undergoing treatment for such a condition. He believes that operative measures are resorted to oftener than necessary, and recommends the employment of the mixed infection serum and electric currents in salpingitis; and the use of iodine in connection with other remedies for a lengthy period of time in fibroid conditions.

L. K. P. FARRAR.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Cherry, T. H.: Description of a Simple Method of Performing Extraperitoneal Cæsarean Section. *Am. J. Obst.*, N. Y., 1917, lxxvi, 590.

The author states that it is sometimes possible to do an extraperitoneal cæsarean section when the classic section is contra-indicated, as in infected genital canals. Such a procedure is also preferable in patients with relatively contracted pelves who have been in labor for a long time.

The two different methods of extraperitoneal cæsarean section are (1) that by which the peritoneal cavity is not opened; and (2) the transperitoneal route, in which the edges of the incised parietal peritoneum are sutured to the visceral peritoneum of the uterus before the latter is opened.

The author outlines briefly the methods and modifications by Sellheim, Latzka, Gellhorn and Hirst. He then gives his method which is a modification of that used by Hirst. The usual abdominal incision is made down to the peritoneum. The muscles are then separated from the peritoneum along the entire length of the incision and for about 1½ inches to either side. The peritoneum is then opened vertically, the edges separated and sutured to the visceral peritoneum in such a manner that an oval area of the visceral peritoneum about 3½ by 5 inches is left exposed over the lower uterine segment. Interrupted sutures are used. Then the uterus is opened, the child extracted with forceps, and the placenta delivered. One ccm. of pituitrin is then given intramuscularly, followed by 30 minims of ergotole.

The uterus is closed with interrupted chromic catgut sutures, the sutured edges of the parietal and visceral peritoneum are brought together, and the wound closed in the usual manner. W. L. Brown.

Cumston, C. G.: The Indications for Cæsarean Section Based on Twenty-Nine Personal Cases (Les indications de l'operation césarienne d'après 29 observations personelles). *Rev. méd. de la Suisse Rom.*, 1917, xxxv, 691.

The cases of cæsarean section reported by Cumston occurred principally among American women. There was no death among the 29 women and only 1 death among 33 infants. Discussing the various factors calling for operation and the course to be pursued, Cumston believes that in cases where there is serious doubt of the possibility of labor either spontaneous or requiring slight intervention, it is better to resort to the cæsarean operation unless the patient prefers to await the first labor pains, and knows the dangers to which she is exposed. When doubt exists in the last month of pregnancy an attempt should be made under anæsthetic to engage the head in the superior canal. If this attempt succeeds and there is no other factor which would indicate cæsarean operation, then the first labor pains should be awaited; but if it is not possible to engage the head in the superior canal and especially if the head remains above the symphysis pubis, cæsarean operation should be done without hesitation.

In the case of a strictured pelvis, the transverse diameter of the lower passage should not be less than 8½ cm. and the posterior sagittal diameter should also measure not less than 8½ cm. to allow the passage of a normal child without undue difficulty.

Cumston considers the size of the fœtus, primiparity, previous difficult labors, pelvic operations, and tumors, as factors indicating cæsarean operation. Women having valvular heart disease can withstand a cæsarean operation better than the fatigue of a labor especially if it is the first pregnancy and the soft parts are not yielding. In placenta prævia, if the uterine neck is long, rigid, and badly inclined, abdominal delivery is indicated. Regarding eclampsia as an indication, the author does not think cæsarean delivery necessary if the pelvis is well formed and if there is no excessive vulvar œdema. Statistics of cæsarean operations done in eclampsia show a mortality of 50 per cent, too high a percentage to counsel the procedure.

As a general rule it is better to suture the uterus after a cæsarean operation and to return it to the abdomen than to make an hysterectomy.

W. A. Brennan.

Warner, F.: A Case of Cæsarean Section in a Primipara Followed in the Next Pregnancy by Normal Delivery. *Am. J. Obst.*, N. Y., 1917, lxxvi, 598.

Infection following cæsarean section may have two unfortunate results: (1) the death of the patient in many cases; and (2) a poor scar, since the infection involved the wound in the uterine wall and interfered with normal healing.

The dictum that a cæsarean section once performed must always be followed by cæsarean section still has its advocates, but many obstetricians now believe this does not hold if there was no infection of the wound in the first operation, and if it was not done because of a markedly contracted pelvis.

In cases where a high incision was made in the uterus with no infection, it is reasonable safe to allow such a woman to deliver herself spontaneously in subsequent labors. Giving pituitrin in such cases

adds greatly to the risk. Rupture of the uterus following the use of pituitrin has been reported in patients who had had no previous cæsarean section; so one should be doubly cautious in using this drug on a uterus with a scar.

Cases have been reported of spontaneous delivery following previously infected cæsarean sections, but to this group belong most of the ruptured uteri following cæsarean section. Vaginal cæsarean section may be elected if the patient is placed in a good hospital with constant care and observation.

Transverse, fundal, and extraperitoneal incisions are not as safe as the usual high midline incision. In Findley's report of collected cases, he deprecates the use of the bag, tamponing, high forceps, and pituitrin.

In general, the author believes that where healing has occurred without fever or pus formation in the incision, a scar is formed which will probably withstand a normal delivery, especially if the wound has been sutured with care. Both types of scars require constant observation in a well-equipped hospital during the last weeks of pregnancy and confinement.

The author reports a case of normal spontaneous labor following a previous cæsarean section.

Cæsarean section should be done in a primipara with a rigid and undilatable os, only where the vagina has not been contaminated by various examinations and manipulations. The author advises dilatation and podalic version in these cases.

If cæsarean section must be done in such potentially infected cases, Newell believes it should be associated with hysterectomy at the time.

In his conclusions, the author states that cæsarean section performed early in labor, before vaginal examinations and manipulations have been done, is as safe as any ordinary abdominal operation. In these latter cases craniotomy or podalic version are preferable to abdominal delivery. However, if a cæsarean section is necessary, a hysterectomy should be done. If a normal delivery is attempted in a subsequent labor, it should be done in a well-equipped hospital, where the patient can be watched for signs of the scar yielding. The operating room should be ready for instant service. Only rectal and not vaginal examinations should be made.

W. L. Brown.

LABOR AND ITS COMPLICATIONS

Danforth, W. C.: Nitrous Oxide Analgesia in Obstetrics. *Am. J. Obst.*, N. Y., 1917, lxxvi, 563.

An analgesic in labor has been sought for years. Chloroform, first used, has proved toxic for the parenchymatous organs of both mother and child when used over a long period. Ether was used, but like chloroform has the disadvantage of diminishing the force and frequency of the pains.

The author gives a brief sketch of the use of nitrous oxide, and reports work done along this line in the Evanston maternity hospital. A very important point in its use is to begin the nitrous oxide inhalations early with each pain. To do this, the anæsthetist is advised to keep one hand on the fundus of the uterus in order to ascertain the very beginning of a contraction.

Cyanosis is to be avoided; and if needed a little oxygen is added to the gas. Sometimes a few breaths of oxygen are given at the end of the contraction to strengthen the patient.

In cases where violent and frequent pains render laceration imminent, a little ether vapor is added to the mixture. This permits better control of the patient, does not nauseate, and does not prolong her complete recovery. Ether is always used for operative procedures and extensive perineal repairs.

After delivery and before tying off the cord, inhalation of a few breaths of oxygen will often restore a clear pink color in a cyanotic baby.

A total of 469 patients were given this type of analgesia for from five minutes to seven hours. Out of this number, only 7.5 per cent could be considered as having unsatisfactory results.

The condition of only 32 babies was reported as not good. This included those whose condition was reported as "fair."

Causes other than the anæsthetic explained this condition in 12 cases. In 7 cases forceps delivery had been done and in 1 a breech extraction.

There were 6 stillbirths. Such conditions as hydrocephalus, premature labor, face presentations, craniotomy and breech presentations were assigned as causes.

Several cases of hæmorrhage in the newborn occurred. Ferguson thinks this hæmorrhage might be due to the nitrous oxide, and attributes it to a hæmolysis resulting from cyanosis, or partial asphyxia. However, the author states that there has always been a percentage of these cases similar to the present percentage, before the introduction of nitrous oxide.

A marked advantage gained by the use of this analgesic is the freedom from mental and physical exhaustion in patients delivered under the influence of gas. Nurses who attended cases where the gas had and had not been used, in some cases upon the same patient, noticed a marked freedom from signs of exhaustion and mental strain.

In his conclusions the author states that the gas should be given interruptedly for not more than three hours. It should be started immediately at the onset of each pain. Cyanosis is to be avoided. He lays stress upon the fact that experience is necessary in giving the nitrous oxide in order to obtain ideal results.

W. L. Brown.

Davis, C. H.: A Study of Chloroform, Ether and Nitrous Oxide-Oxygen in Pregnancy and Labor. *Am. J. Obst.*, N. Y., 1917, lxxvi, 557.

Nitrous oxide-oxygen analgesia is being used much more extensively in labor now than formerly. The results vary materially, due to lack of experience on the part of the obstetrician. Some prefer chloroform or ether because these are less expensive.

The toxicity of the various anæsthetics is considered and conclusions are drawn from experiments done on pregnant and non-pregnant guinea pigs.

Degenerative changes in the tissues follow long administration of chloroform, ether and nitrous oxide-oxygen to pregnant or non-pregnant guinea pigs. The changes in the liver are the most constant. If these degenerative changes do not result in death, gradual recovery may follow after a considerable time.

Chloroform causes central necrosis which is more permanent, while ether and nitrous oxide-oxygen produce changes coincident with cell asphyxiation. This dangerous element in the use of chloroform is not eliminated by using pure oxygen with it.

Long continued use of these anæsthetics must be considered dangerous to the fœtus *in utero*, though nitrous oxide-oxygen analgesia is less dangerous than anæsthesia. However, there is no reason to believe that the long continued intermittent use of four or five inhalations with each contraction can be of any material danger to the fœtus.

Chloroform does not cause death readily in obstetrical work, but it does produce central necrosis and fatty changes. These changes occur even though pure oxygen is given with the chloroform. These changes occur in the fœtal liver tissue no doubt as a result of direct injury to the fœtal liver by the chloroform absorbed through the placenta. Ether produces changes similar to those produced by nitrous oxide-oxygen but more permanent, perhaps because a much longer time is required to eliminate the ether from the tissues.

Nitrous oxide-oxygen administered to the pregnant guinea pig may cause death of the fœtus without any apparent signs of asphyxia in the mother. This is probably due to inability of the tissues to use the oxygen in the blood in the presence of a high nitrous oxide concentration.

Danger from the use of nitrous oxide is primarily due to the long continued interference with the cell metabolism. This factor does not exist in the intermittent use of a few inhalations with each uterine contraction in labor, for the gas is quickly eliminated after each pain.

In conclusion, the author states that ether is the anæsthetic of choice for long operative procedures in pregnancy or labor, while nitrous oxide-oxygen is preferable for short operations and examinations. As an analgesic early in labor, the author advises the use of an opiate alone or with chloral hydrate or scopolamine. During the painful second stage, nitrous oxide-oxygen is the most desirable, and chloroform is less desirable than ether. W. L. Brown.

PUERPERIUM AND ITS COMPLICATIONS

Bland, P. B.: The Treatment of Infection Following Labor, Mature and Premature. *Penn. M. J.*, 1917, xxi, 28.

Infection following labor forms one of the big economic topics of the present time, the author declares.

In 1914, 10,518 women died in this country from childbirth, and these figures represent the deaths in only two-thirds of the estimated population of the United States. From these figures one would be justified in believing that at least 15,000 women die in America every year as a result of labor. If the mortality that results from complicating conditions is added to these the author believes with De Lee that the total death rate would reach 20,000. If the mortality, therefore, of puerperal infection, as is generally conceded, is about 5 per cent, it would mean that in 1914 there were 100,000 infected puerpera in this country.

These figures have to do with labor at term. Exact figures concerning the number of abortions that occur are not obtainable. It is known, however, that about one abortion occurs for every four or five full term labors. The infection resulting in these cases arises either from interference or concealment and lack of care on the part of the patient during convalescence.

In considering the treatment Bland divides its application into: first, infection following labor at full term; (a) with the uterus empty and specific puerperal bacteræmia; (b) with secundines retained; and secondly, infection following abortion.

In the first type the treatment is essentially conservative and along medical lines: rest, physical and mental; fresh air, day and night; feeding to the point of gastric toleration; elevation of the head of the bed; no purgation. Purgation, the author believes, does more harm than good. Elimination is favored by the free administration of water by the mouth and by the bowel. So-called specific therapeutic agents as serums, vaccines, and phagocytic stimulants in general have been discarded. As a rule, no drugs are given. Local interference of any kind is rarely indicated and its routine employment is mischievous. He emphasizes and condemns the futility of local measures which are still so frequently practiced. Curettage is a pernicious measure, and should never be used. Irrigations do no good and may be harmful, and even manipulation should not be resorted to unless there is some definite and positive indication.

In cases of material retained the author believes in waiting and trusting to the efforts of nature. If the retained material is not discharged within a reasonable time, it should be gently withdrawn either with placental forceps or with the finger. This procedure should never be followed by irrigation or curettage.

The treatment of infection following abortion is along the same general conservative lines, instituting general rather than local measures. Routine and habitual use of the curette should not be resorted to. Irrigations, too, are pernicious and do more harm than good.

The plan of treatment pursued by Bland is based on the modern knowledge of an individual's powers to vaccinate herself autogenously, to develop an active immunity. This has overcome the assump-

tion that puerperal infections are surgical emergencies, and should be treated by emergency methods. The author is convinced that ordinarily from an economic and conservative standpoint, both as concerns mortality and morbidity, better results will accrue from the application of conservative medical measures than from indiscriminate and hasty employment of surgery.

In discussing the treatment of localized collections in the pouch of Douglas or in the fallopian tubes as a result of puerperal infection, the author believes in a waiting policy. Medical measures should be tried first; if these fail, surgical treatment may be resorted to. Early or hasty surgery in limited puerperal exudate or puerperal tubal infection, in view of the present knowledge of immunology, is not indicated and its general practice means sacrificial and frequently unnecessary operation. The axiom usually applied to the operative treatment of pelvic inflammation to wait until the temperature reaches normal and then to operate is a wise teaching, but it does not fully cover the premises. At this period, nature's therapeutic agencies are just becoming operative. They should be given a chance. Wait until the temperature reaches normal and then continue to wait. In so doing a dangerous and mutilating operation may be avoided and anatomical structures may be preserved with physiological action.

The author believes that the whole aim of the surgeon in treating cases of puerperal infection should be directed, first, to conservation of life and health; second, to economy of tissue; and third, to preservation of function. He believes, furthermore, that these factors are better accomplished by relying on the power inherent in nature than by instituting indiscriminate and dangerous surgery.

MISCELLANEOUS

Smith, M. K.: Review of Recently Delivered Cases Observed During the Course of One Year in the Gynecological Class of the First Division of the Hospital. *Bull. Lying-In Hosp. N. Y.*, 1917, xi, 193.

During the year extending from November 22, 1915 to November 22, 1916, there were 289 cases in the gynecological clinic of the First Division of the Lying-In Hospital, representing about that same number of individuals. These cases were divided as follows, according to months: First month, 81; second month, 92; third month, 38; fourth month, 39; fifth month, 20; sixth month, 19. In other words, as would be expected, it is the newest mothers who require the closest oversight.

The complaints also vary in incidence and character with the months. In the first month postpartum subinvolution is the commonest ailment, occurring in more than one-fifth of the cases. Unhealed perineal lacerations are a close second and nipple complaints a third. Rectal conditions, fissure and hæmorrhoids, and retroversion follow, but are less frequent.

In the second month breast and nipple conditions occupy first place, abscess being the least frequent among these conditions. Subinvolution takes second place and lacteal conditions third, while unhealed perineal lacerations make a close fourth. Back strain comes next, while adnexal or parametrial disorders and retroversions are not infrequent.

The third month sees a marked drop in the number of cases. In this period retroversion stands ahead, while the other conditions mentioned as appearing in previous months appear with about equal frequency, with the exception of subinvolution which becomes less important.

In the fourth month, adnexal and parametrial conditions occupy first place while a new cause for seeking advice takes second place, namely, the question of a new pregnancy. By this time unhealed perineal lacerations and breast conditions are relatively infrequent.

In the fifth and sixth months, the pregnancy problem holds first place, with retroversion a close second. Other conditions, although still found in the list, are overshadowed by these two.

To summarize, the youngest mothers come back with subinvolution, breast and nipple inflammations, unhealed perineal lacerations, anal fissures and hæmorrhoids, as the chief complaints, conditions depending more or less closely on labor and the early weeks of lactation. These give way in importance toward the end of the first half-year to a more permanent sequela of improper involution, retroversion, and to the question of another pregnancy.

C. D. Holmes.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Hinman, F.: Urological Diagnosis in General Practice. *Calif. St. J. Med.*, 1917, xv, 392.

The necessity is emphasized of properly performed routine urological examinations on the part of the general practitioner, which will enable him not only to make an earlier diagnosis of cases but also to refer at an earlier date particular cases requiring a more complete urologic study.

The close anatomic and functional association of urinary and genital cases permits one general preliminary examination to cover all cases. On the indications of such a preliminary study, more detailed investigations would differ according to whether a lesion of the upper or lower tract were suspected.

In the study of kidney cases careful urinary, X-ray and renal functional studies are required as preliminary to the more special examination of cystoscopy, wax-tipped exploration, separate functional studies, pyelography, etc. Likewise cases with acute or chronic lesions of the lower genital tract are followed in a routine way.

The viewpoint of the urologist in analyzing urine should be more generally adopted by the general practitioner. Pus, blood, and the type of infection take precedence in his mind over specific gravity, albumin, sugar, and casts. The explanation of a few pus or blood cells as urethral or vaginal contamination is altogether too common; a simple method of collection will definitely determine the question. Catheterization or the use of the three-glass method, and the examination of a centrifugalized smear with methylene blue stain carry considerable diagnostic value. Pus, blood, and bacteria in the bladder urine, no matter how small in amount, are pathological. A large percentage of pyuria cases are treated for cystitis without proper investigation. Usually cystitis is present in these cases but the cystitis is secondary and will clear up without treatment upon a cure of the primary focus.

Primary cystitis in the male sex is practically unknown and is extremely rare in the female. It is a grievous error, therefore, to institute any treatment for cystitis without first ascertaining the condition of the urinary tract below the bladder, and, if found negative, thorough investigation above the bladder should be made.

The causes of urinary frequency and difficulty in the male can usually be accurately recognized by the general practitioner, if he will make an intelligent rectal examination and will use a urethral catheter not only to measure residual urine but also the length of the posterior urethra. Practically every man who presents symptoms and signs of prostatic hypertrophy and who has residual urine should be advised to have an operation.

The practitioner should be aware that the X-ray examination for calculus of the urinary tract is not infallible; 20 per cent of stones, in the ureter particularly, are missed. History reports of six cases are given in detail by way of illustration of urological conditions which are recognized late in their course and which, by the routine procedure as outlined, could have been recognized early and the grave prognosis in each case probably saved.

Hallé, N.: Chronic Renal Tuberculosis (La tuberculose rénale chronique). *Presse méd.*, 1917, p. 633.

Hallé thinks that surgical treatment is indicated in renal tuberculosis of open pyelitic form, whether primary or secondary. Operation should be early when observation shows that medical treatment is a failure. Indication for operation is debatable only in benign cases with slow progress. A spontaneous recovery may be expected if the patient is kept under careful surveillance and if prompt intervention is practiced in the event of aggravation.

Surgical treatment is contra-indicated in closed parenchymatous tuberculosis.

Total nephrectomy is the only efficacious and sure means of surgical treatment. Medical treatment is always a useful ally to the surgical treatment, both in preparation for the operation, and afterward.

The author discusses the polymorphism of renal tuberculosis. He thinks that tuberculosis with a tendency to spontaneous recovery corresponds to the type of closed parenchymatous tuberculosis in which the bacillary infection is hæmatogenous. Renal tuberculosis with no tendency to spontaneous cure is the clinical form corresponding to open pyelitic tuberculosis in which the infection is lymphogenous and often a mixed infection.

W. A. BRENNAN.

Martin, A. P.: Hæmaturia in Kidney Calculus (La hematuria en los calculos renales). *Siglo méd.*, Madrid, 1917, lxiv, 568.

Martin says that the characteristics of hæmaturia which are significant of calculi in the urinary apparatus are its appearance after exercise, and its slight intensity and short duration. As in other clinical experiences there are exceptional and anomalous cases. Martin gives the histories of three cases in which hæmaturia was the only clinical symptom of renal calculus which was found to exist.

W. A. BRENNAN.

Long, H. W.: Pyelitis in Children. *J. Mich. St. M. Soc.*, 1917, xvi, 438.

Pyelitis in infants is far more common than the average physician believes. Long contends that urinary infection occurs in one per cent of all cases of childhood. He also states that pyelitis is one of the most common of all the so-called obscure causes of fever in infancy and childhood. It occurs most commonly in female infants. The urine does not always show pus because occasionally the ureter becomes plugged with infective material. For this reason it is necessary to make repeated urine studies.

The most important symptoms are chill and high temperature. His treatment consists of large quantities of water and fluids generally, alkalies, malt soups and vegetables. Medicinally he administers potassium citrate in doses of 90 to 120 grains daily; hexamethylene in one-grain doses, salol, and cathartics to keep the bowels active. He believes vaccines may have some effect at times.

H. W. E. WALTHER.

Fullerton, A.: Gunshot Wounds of the Kidney and Ureter as Seen at the Base. *Brit. J. Surg.*, 1917, v, 248.

Fullerton reports his experience in the pathology and management of 42 cases of renal injury from gunshot wounds as seen at the base hospital.

The eventual pathology depends upon the structure involved in the injury, and for convenience injuries are divided into (a) those of the hilum, which may be the severance or trauma of an artery resulting in fatal hæmorrhage at once, or if a small artery, in anæmic infarction and eventual necrosis of the particular part of the kidney nourished by that artery; (b) wounds of the pelvis which are not frequent when uncomplicated; (c) wounds of the parenchyma which may completely destroy the organ or simply perforate it; (d) wounds of the ureter, usually present only with involvement of other structures.

The resultant pathology depends upon (1) direct damage; (2) damage due to interference with the blood supply; (3) damage due to pressure from hæmorrhage; (4) results of sepsis. Fullerton believes and presents evidence to support his belief that renal injuries so produced are purely local in character and that microscopic sections from parts distinct from the injury present no disorganization, as reported by others.

By studying the ureteral catheter urines as to specific gravity, presence of cellular structures, i.e., pus, blood, micro-organisms, and permeability to dyes, he finds that the cases may be divided into (1) those in which a rapid recovery takes place and where the function and urine of each kidney is normal after a week or more; (2) those which present a urine distinctly lower in specific gravity than its fellow, a functional test which he believes to be of much importance not only in injuries but in infections and calculi as well; (3) those presenting disturbance of function as determined by indigo-carmine permeability. A definite increase in the time of appearance was noted on the affected side in some patients. Abnormal cellular constituents were found on the affected side in most instances.

To locate missiles the Mackenzie Davidson technique is used with much success. In many cases opaque ureteral catheters are passed into the renal pelvis and stereoscopic radiograms made with excellent results, determining thereby the exact location in many reported cases of the foreign substance within or without the kidney or ureter.

A special apparatus is described which is used to reconstruct the track produced by the missile. This apparatus in connection with cross sections of the body gives results as to the organs traversed by the bullet which postmortem and operation have shown to differ very little from actual conditions. It is of vast importance in cases of hæmaturia where surgical interference is indicated, cystoscopy failing, and no other method available to ascertain which kidney is in the path of the missile.

The associated injuries in order of frequency are those of the pleura, liver, spleen, spine, hollow viscera and pancreas; while the most prominent symptom is hæmaturia which may be profuse or microscopic, but must be differentiated in all instances of concomitant spinal injury from hæmorrhagic cystitis. Urinary fistula of course is diagnostic, while shock, anæmia, vomiting, abdominal distention, dullness in the flanks, and tumor may or may not be present, depending upon the extent of involvement and the complications. Sepsis is a common complication due to the presence of hæmatoma and necrotic tissue, which make excellent culture media, and the close proximity of the colon which may supply the original infectious material.

Secondary hæmorrhage is a relatively common and severe complication, occurring in 9 of 42 patients reaching the base whose kidney injury was either treated conservatively at the clearing station or was not known to be present. In several patients with secondary hæmorrhage there was no evidence or history of hæmaturia at the time of the injury, although there might have been a microscopic hæmaturia, easily overlooked. Nephrectomy was done on 8 of these 9 patients, with three deaths. The onset of the hæmorrhage occurs about 10 or 15 days after the injury. Fullerton states that secondary hæmorrhage is prone to occur in injured kidneys; as the blood supply is out of all proportion to the size of the organ, the blood-pressure is subject to sudden and frequent change; and collateral circulation being absent, the necrotic areas about the track of a missile tend to favor local sepsis which is always present in cases of secondary hæmorrhage.

Unfortunately there are no conservative methods of treating secondary hæmorrhage. The blood supply of the kidney is such that ligation is impractical, and complete nephrectomy must be done providing it is definitely known that the second kidney functions well. Many patients are nephrec-

tomized when partial resection might have been done, but Fullerton believes these cases are so few and the possibility of complete success so remote that he practices complete nephrectomy in all instances. When bleeding persists after the tenth day and is of sufficient quantity to produce anæmia, or when a sudden profuse hæmorrhage occurs, surgical intervention should take place at once.

Urinary fistula from injury of the pelvis, ureter or calyces through the parenchyma may immediately follow the injury or develop later, due to sloughing of the traumatized parts. These uncomplicated fistulæ are not treated surgically at the base hospital, but later may require nephrectomy or plastic operations to close them. Fortunately many of the complications disappear spontaneously.

The chief causes of death in this series of cases were associated injuries, renal sepsis and secondary hæmorrhage. HARRY CULVER.

Iturbe, I., and Gonzalez, E.: Results Obtained with the Phenolsulphonephthalein Test in Functional Diagnosis of Kidney Diseases (Resultados obtenidos con la prueba de la phenolsulphonephthalein en el diagnostico funcional de las enfermedades renales). *Gac. méd. de Caracas*, 1917, xxiv, 113.

The authors' study of Rountree and Geraghty's method of testing the kidney function is based on 80 cases in which it was possible to study the curve of elimination of phenolphthalein in the first and second hour after its injection.

The procedure employed systematically in all cases was as follows:

1. One hour before the injection 400 ccm. of water was administered to the patient and his bladder emptied, by the catheter if necessary.

2. An injection of 1 ccm. of phenolphthalein was made deep in the muscle masses of the lumbar region or intravenously, care being taken not to lose a single drop of the fluid since it might lead to an erroneous result.

3. Precisely one and two hours after injection the patient's urine was collected separately and the quantity of coloring material was determined by Autenrieth's colorimetric method.

In normal subjects the phenolphthalein appears in the urine in from six to ten minutes after a subcutaneous injection and is eliminated in 50 to 60 per cent within one hour; the elimination is 15 to 25 per cent in the second hour. If the injection is intravenous the substance appears in the urine in three to five minutes and there is an elimination of 65 to 80 per cent in the first hour.

A table of results shows that in subjects with functional integrity of the kidneys in which repeated examinations have failed to disclose any trace of albumin or casts, pulse and arterial pressure being normal, the elimination curve shows more than 70 per cent of the injection as a rule in two hours. Another tabular statement shows the relations existing between the phenolphthalein eliminations and the character of certain kidney lesions. This table makes it evident that whenever a kidney lesion exists the phenolphthalein test gives precise indications of the state of the organ. In acute nephritis due to eruptive fevers, etc., the elimination increases as the symptoms improve.

From their own experience the authors believe that many of the contradictory results obtained by other investigators are not logically deducible from the data. Many such cases occur in women with severe genital affections or those advanced in pregnancy, and in spite of a functional integrity of the kidney the urinary secretion is disturbed.

In making the injection the bladder should be completely empty. Moreover, some have made the injection in the gluteal region, in which it is well known there is much fatty and connective tissue which makes the absorption of the injected fluid difficult. This disadvantage is overcome by injecting in the lumbar region, which is well vascularized and in which absorption is very rapid.

W. A. BRENNAN.

Kretschmer, H. L.: Ureteral Calculus; Removal by Intra-Ureteral Injections of Oil. *Surg. Clin. Chicago*, 1917, i, 1011.

The author discusses the diagnosis of ureteral calculi and calls attention to the fact that calcification of the ligaments, calcified lymph-nodes, plaques in the arteries and veins, phleboliths, and areas of calcification in the seminal vesicles or broad ligaments always give shadows that at first glance one would interpret as ureteral stones. He shows how nicely the differentiation between these shadows and those caused by true ureteral calculi can be made by using the shadowgraph ureteral catheter. No ureteral stone should be operated upon until a persistent effort has been made to relieve the patient by cystoscopic means.

He cites two cases of stone in the ureter, the first of which was relieved by a slitting of the ureteral sphincter with the cystoscopic scissors and simultaneous injection of oil into the ureter. Four subsequent injections of oil were made; two days after the last injection the patient passed the stone. The second case received three injections of oil. The author states that only four or five per cent of ureteral stones cannot be relieved by intravesical manipulations. V. D. LESPINASSE.

BLADDER, URETHRA, AND PENIS

Bennett, A. K.: Vesical Calculus. *J. Mich. St. M. Soc.*, 1917, xvi, 440.

The recent experiences of Bennett in Mesopotamia form the basis for a report of 700 cases operated for stone in the bladder. The author discusses the etiology of this condition as found in the people who inhabit certain marshy localities along the banks of the Tigris and the Euphrates. Studies in parasitology recently carried out in the laboratory of tropical medicine in Liverpool tend to show that certain worms play a very important part in the

formation of vesical calculus, most particularly the bilharzia worm which is endemic in Egypt, the Soudan, and in the western parts of Arabia.

The worm is found in the portal and mesenteric veins but in these structures does not become markedly active. They commonly reach full development and sexual activity in the urinary bladder and rectum. Here the ova are deposited and multiply, and in each spot of accumulation in the walls of the bladder great proliferation of the mucosa is produced and a spongy tissue resembling papilloma or epithelioma is produced. These papillomata are exceedingly friable and hæmorrhagic, so that contracture of the muscle walls of either the bladder or the rectum may produce severe hæmorrhage. The worm gains entrance to the body by means of drinking water or through the skin. Men and boys are the greatest sufferers; only one per cent of females have been found affected.

As to treatment, Bennett states that in papilloma, perineal lithotomy with curettement of the bladder and removal of the spongy tissue is practised by the physicians of Egypt. For the removal of bladder calculi lithoplaxy is the operation of choice by the surgeons of India and Turkey. Bennett, however, states that most of his cases were relieved by suprapubic cystotomy. He leaves no drainage above but inserts an indwelling catheter into the urethra which is removed on the third day. H. W. E. WALTHER.

Selmi, M.: Bladder Calculi in Infants (Il piu piccolo ed piu grande dei calcolo vesicali da me curati nei bambini). *Policlin.*, Roma, 1917, xxiv, *sez. prat.*, 1078.

Selmi refers to two cases of vesical calculus in infants, the first and the last in a series of 23 cases operated upon by him. The calculus in his second case weighed 75 gr., the largest not only of his own cases but among all of those reported in literature. Selmi prefers cystotomy to lithotrity in the treatment of vesical calculus, and thinks that in all cases very careful radiologic investigation as well as cystoscopy should be made so as to verify the conditions in the genito-urinary tract.

Referring to the surgical steps necessary to prevent recurrences, the author thinks that in cases of calculus complicated by cystitis it is necessary to establish and maintain for some time a large external aperture from the bladder; this is indispensable for the recovery of the cystitis and also prevents a rapid recurrence. The child operated upon for the large calculus, 7 years old, was a mere skeleton at the time of operation and is now in excellent health. W. A. BRENNAN.

Legueu, F.: Bladder Wounds (Sur les plaies de la vessie). *J. d'urol. méd. et chir.*, Par., 1917, vii, 1.

Legueu has observed 43 bladder wounds since the beginning of the war. These rarely reached him in the first days of injury; the men were seen only after they had been passed along by several ambulances. Only cases in which the bladder wound was the predominant lesion are considered. When the bladder wound is coincident with a severe abdominal wound, the latter indicates the gravity of the case and governs the treatment. Such wounds are excluded in this report.

The four factors which dominate the history of bladder wounds are: (1) the immediate and remote benignancy of a certain number of these wounds; some with perforation or even with the bladder entirely traversed have progressed without any grave complications; (2) the frequency of recto-sigmoidal communications; (3) the existence of a concomitant injury of the pelvic girdle; (4) the presence of foreign bodies in the bladder.

Six of the wounds observed ran a benignant course. Such are usually bullet wounds; shell wounds show important tears and easily produce a septic condition.

The neighborhood of the bladder and intestine explains the frequency of fistulæ. In 15 of the cases there was a vesico-intestinal fistula. The site of perforation cannot always be easily found, and only in 2 cases was it found by rectal palpation. In these 15 cases there were 12 spontaneous recoveries without operation in a period varying from a few weeks to four months. The number of spontaneous recoveries shows the small need for early operation if a fistula develops.

Lesion of the pelvic girdle was observed in 29 cases or 50.9 per cent.

The immediate effect of such fractures is to create a path through which the urine easily reaches the exterior; and the consequences of this are infection, suppuration and general thermic reaction. When the fistula persists, the end-result very frequently is an osteopathic fistula of the bladder, with the formation of calculi. There were 10 cases which showed calculous formation of this kind.

In the 43 cases treated, a foreign body required removal in 12. This was in addition to those extracted before the cases reached the author.

Treatment should be immediate and include disinfection of the tract, removal of fragments of bone, etc., and extraction of foreign bodies. The vesical cavity should be thoroughly explored both by radiography and radioscopy; if these means are not available, every other known method of surgical exploration should be utilized.

Such treatment does not suffice to prevent infective complications, and it appears necessary as soon as possible, sometimes on the first day, to make a suprapubic cystostomy. The indwelling sound in such cases is only a make-shift to be employed when nothing else can be done. This operation was done by the author 11 times in the first days of injury; in 15 other cases it was done as a secondary operation. In all cases where an early operation was done, recovery followed; but even when done later, drainage was good and cicatrization was hastened. Experience has shown Legueu that a median cystostomy is the best measure for primary disinfection of the vesicocutaneous wound. W. A. BRENNAN.

Fowler, H. A.: Syphilis of the Bladder. *J. Am. M. Ass.*, 1917, lxix, 1399.

Syphilis of the bladder was considered rare formerly, and its existence even denied; in the last sixteen years, however, a number of authentic cases have been reported, the clinical data of which was sufficient for considerable thought and study. The history of cystic lues has three periods.

During the first period extending to 1879, cases of syphilitics which came to necropsy with findings of ulcers, tumors, or perforations of the bladder were considered specific in origin. Proksch found 6 cases, and Morgagni and Ricord 2 cases.

In the second period, cases occurred in which the diagnosis was confirmed by the disappearance of all symptoms following antisyphilitic treatment.

The third period began in 1900 when Matzenauer first described the cystoscopic appearance of tertiary syphilis of the bladder. Since then 40 cases have been reported. In 1909 bladder involvement was found to occur in the secondary stage, as found by routine cystoscopic examinations. Luetic lesions occur also in the tertiary stage, and in parasyphilitic diseases, notably in tabes, the bladder is commonly involved. Age and sex are no barrier. Tabes and the associated bladder destruction is more frequently observed in males; it is more common in middle life.

Secondary lesions of the bladder appear within a few months after infection, and are generally accompanied by lesions of the skin and other organs. The tertiary lesions on the contrary appear after much longer periods, up to twenty-five years. The bladder lesion may be the only evidence of the disease. The majority of cases so far reported belong to the tertiary period. A mild case of cystitis occurring during the secondary stage of syphilis is suggestive and calls for a cystoscopic examination; otherwise the cystitis or a specific infection is easily overlooked, particularly as it disappears under salvarsan and mercury. Nine cases of secondary syphilis of the bladder have been reported, six males and three females. In all cases the bladder lesions were accompanied by secondary syphilis elsewhere, of the skin, mucous membrane, etc. Macules, papules and ulcerations have been described. In some cases the papules were disseminated over the bladder mucosa, resembling condylomata. The ulcers are usually multiple, rounded or oval, superficial with a slightly elevated edge and a necrotic base. The location is more frequently about the ureteral orifices, but may be found in other parts of the bladder. The adjacent mucosa is œdematous, the hyperæmic vessels injected and prominent. The remainder of the bladder appears normal.

Symptoms vary with the location and character of the lesion, and at times are so slight that vesical lesions are found only during routine cystoscopy. With ulceration at or near the vesical neck, symptoms of cystitis more or less acute are observed.

Frequency, urgency and tenesmus may be marked, and are not influenced by rest. Pain is a constant symptom referred to the suprapubic area or perineum radiating along the urethra to the rectum and to the lumbar region. Hæmaturia when present is not profuse and is always terminal. The bladder capacity is reduced. The urine is often clear; in the presence of infection it is turbid. Spirochætes have been reported in the urine but not confirmed. By far the greater number of bladder syphilis cases so far observed belong to the tertiary stage. Gummata of the bladder develop insidiously like all new-growths, and in the early stages produce little or no disturbance. Frequency may be observed; hæmaturia when it occurs is sudden and profuse and may be the first and only symptom. Pain is inconstant, varies with the location of the lesion and the presence or absence of infection as a complication.

As viewed by the cystoscope, two varieties of lesions occur, gummatous ulcerations and papillomatous growths. The former are more common. They occur separately or exist together. Papillomatous lesions are rare, usually multiple, and resemble cancer; operation should not be advised until the therapeutic test has failed. The secondary lesions are superficial. The tertiary involve the deeper layers of the bladder wall and unless arrested may result in perforation with peritonitis and perforation of the bowel. Syphilis is one of the etiological factors in the production of vesico-intestinal fistulæ. Vesicorectal or vesicovaginal fistulæ may result from perforation of the bladder base.

Bladder syphilis is prompt to respond to specific treatment, as is characterized by subsidence of all symptoms and the gradual disappearance of vesical symptoms. The treatments usually employed for ordinary cystitis have no influence whatever on either the symptoms or the lesions.

C. R. O'Crowley.

Thompson, J. E.: A Study of Modern Operations in Hypospadias from an Anatomical and Functional Standpoint. *Surg., Gynec. & Obst.*, 1917, xxv, 411.

The author classifies the varieties of hypospadias into: (1) balanic, (2) penile, and (3) perineal. The adult urethra develops in three distinct parts. The posterior part corresponding to the adult prostatic and membranous urethra is developed from the embryonic urogenital sinus; the penile portion is developed from a longitudinal groove which appears on the genital eminence; the glandular portion results from the tunneling of a special epithelial mass which appears on the under surface of the glans.

Operation is not justified in the perineal type with undescended testicles which are probably sterile and impotent. It is not necessary in many cases of the balanic type with a straight penis. In all others operation is imperative. The suitable date for operation is between the sixth and ninth years. After puberty there is serious danger of an erection during convalescence which would tear the flaps apart.

With regard to operative procedures, in the ante-

rior varieties preference is given to penile and preputial flaps as in the Mayo and Duplay operations. A modification of the Russell operation is described. In the posterior varieties the Russell method is by far the most satisfactory. Bladder drainage is considered essential to success in the one-stage operation and in the final stage of the two-stage operation. Drainage above the pubes is preferred.

GENITAL ORGANS

Robbins, F. W., and Seabury, F. P.: The Treatment of Chancroid. *J. Am. M. Ass.*, 1917, lxix, 1217.

The authors recognize the following clinical varieties of chancroid: (1) ulcus molle, the common type with clean-cut, undermined edges; (2) ulcus molle miliare, occurring most frequently on exposed surfaces in the loose skin, a papule rapidly becoming a pustule; (3) ulcus molle elevatus, slightly raised above a mildly infiltrated base with slight tendency to spread and resistant to treatment; (4) ulcus molle phagedænicus, the most severe form, spreading rapidly and capable of great destruction.

About 60 per cent of all soft sores if kept rigidly clean get well in from four to eight weeks with no treatment other than calomel dusting powder. Thorough cauterization with nitric acid within the first two or three days will sterilize the sore so that healing will take place. The authors advocate the use of a 25 per cent solution of copper sulphate and the short high frequency spark from a rather fine-pointed vacuum electrode applied directly to the sore for from one to three minutes. The point of the electrode is carried well down into any fissure or undermined edge and about one-sixteenth of an inch into the doubtfully healthy area. Any exposed sore is then covered with a thick, moist, mildly antiseptic dressing changed frequently. If completely sterilized on the second day the wound will present a perfectly healthy granulating surface which begins to heal in a few days. If not, the same procedure is repeated every second day.

This method of treatment has enabled the authors to report practically 100 per cent of early cures in a series of about sixty cases. H. W. PLAGGEMEYER.

Ramos, C.: Rupture of the Tunica Vaginalis in Hydrocele (Des ruptures de l'hydrocèle vaginale). *J. d'urol. méd. et chir.*, Par., 1917, vii, 45.

Rupture of the tunica vaginalis in hydrocele is very rare. The first case in literature is reported by Bertrandi in 1757, and it has become less frequent since the introduction of improved surgical technique in the treatment of hydrocele.

Spontaneous rupture is rare and most cases are due to a traumatism by muscular effort. The author has observed two cases in Legueu's clinic, one traumatic and the other spontaneous. The traumatic case occurred in man of 65 years with a left-sided hydrocele. Operation by Legueu disclosed a vertical tear of the serosa about 3 cm. long on the antero-internal wall of the vaginal sac.

The spontaneous rupture occurred in a man of 49 with a left-sided hydrocele. About 6 months before coming to the clinic the man observed that the tumor had altered its habitual shape and had become soft, flaccid, and considerably larger. There was no pain nor feeling of rupture. Operation disclosed a vertical slit in the serosa about 2 cm. long and situated in the middle part of the anterior face. Both cases recovered.

The author reviews from the literature 7 traumatic cases, 6 due to muscular effort, and 2 spontaneous cases. A consideration of the cases shows that there is no site of election for vaginal ruptures. Experimental research work done at autopsies confirms this view. Pre-existing lesions and the more or less sudden distension of the sac by a rapid increase of effused fluid are predominant factors in the mechanism of spontaneous rupture.

Clinically the constant and most striking symptoms are immediate change in the form of the tumor and scrotal œdema. In many cases after absorption of the effusion and obliteration of the orifice of perforation, the tumor is reproduced very rapidly.

W. A. BRENNAN.

Cecil, A. B.: Surgical Treatment of Seminal Vesiculitis. *Calif. St. J. Med.*, 1917, xv, 497.

The author describes the anatomy, pathology and symptomatology of seminal vesiculitis, and reports two cases and the surgical procedures followed.

While gonorrhœa plays an undoubtedly large part in the original infection, Cecil claims the gonococcus is supplanted by other bacteria, and it is his purpose to make cultures at the time of operation, as the study of the vesicles after death is inconclusive because of the known frequency of postmortem infection. The author also claims that in cases presenting symptoms of chronic cystitis, it is not alone sufficient to rule out the question of infection of the kidneys and the cases of mechanical obstruction and intravesical causes, but it is also necessary to thoroughly investigate the seminal vesicles. He reports two cases to support this contention.

The condition has been attacked surgically by four different methods: namely, vasopuncture, with spermatocystic medication, vasotomy with drainage of the vesicles through the vas, vesiculotomy and vesiculectomy. Vasopuncture has proved to be of considerable value but it has its limitations, as in occlusion of the vas, cases in which infection is walled off in a part of the seminal vesicle or is located in a walled-off diverticulum of either the ampulla of the vas or the seminal vesicle. The same objections are offered to vasotomy. Cecil states that in cases of seminal vesiculitis which seem to persist in spite of massage, it is of great diagnostic value, for it is evident that if the ejaculatory duct is occluded on one side or both, massage of the seminal vesicles must be worse than useless. He believes that seminal vesiculectomy is the operation of choice.

In his operation he follows Young's technique, using his tractor which avoids tearing the prostate

and enables him to palpate on the instrument in the bladder and to rotate first one vesicle into view and then the other. He lays especial stress upon having an exaggerated lithotomy position. He avoids using a rectal plug, as it causes discomfort and is liable to cause a rectal fistula. LOUIS GROSS.

Judd, E. S., and Braasch, W. F.: The Advisability of Prostatectomy in the Presence of Cord Lesions. *Illinois M. J.*, 1917, xxxii, 229.

Judd and Braasch discuss the advisability of the removal of the prostate in cases presenting signs of lesion of the spinal cord. Nine such cases have been operated upon at the Mayo Clinic. One of these died eighteen months after the operation. Sevén report that they are in good condition and have no urinary trouble. One, operated upon six months previously, still complains of frequency of urine and of a slight degree of incontinence.

The authors believe that the question of operation should be decided according to whether the difficulty of urination is due to mechanical obstruction or not. This fact can be determined through cystoscopic examination and by observing the expulsive power of the bladder muscle. If the clinical evidence of advanced cord lesion is well marked, operation is contra-indicated, but in early cases or in those in which the tabes involves some portion of the cord other than that which controls the urinary mechanism, the question of prostatectomy should be carefully considered. G. G. SMITH.

MISCELLANEOUS

Eisenstaedt, J. S.: Mechanical Aids in the Diagnosis of Lesions of the Upper Urinary Tract. *Surg. Clin. Chicago*, 1917, i, 799.

The author discusses in detail the various methods of exact diagnosis used in genito-urinary diseases and contrasts this with the clinical findings. He summarizes as follows:

1. There are various methods for examination in the diagnosis of lesions of the urinary tract.
2. These overlap and supplement each other.
3. These include cystoscopic examination, ureteral catheterization, X-ray, and chromocystoscopy.
4. The clinical and laboratory findings should not be neglected.
5. The necessity for the use of these procedures lies in the fact that many serious lesions may pass under the mask of various other diseases.

A. C. STOKES.

SURGERY OF THE EYE AND EAR

EYE

Magitot: Wounds of the Eye in War (Les plaies de l'oeil en pratique de guerre). *Rev. gén. de clin. et de thérap.*, 1917, xxxi, 657.

There are three types of eye injuries in war: lacerations, wounds of the posterior part of the ocular globe, and wounds of the anterior part.

Lacerations usually accompany complicated orbital fractures or maxillary-facial fractures. The treatment is disinfection of the region, with lavage of the globe with hypertonic salt solution, and enucleation. The conjunctiva must be respected as much as possible, so as to obtain after cicatrization a cavity well adapted for an artificial eye.

Injuries of the posterior part of the globe can occur without wounding of the lids and may be: (1) a wound of the external angle of the eye; (2) a wound of the temporal orbital wall; (3) an intraocular hæmorrhage affecting only the posterior segment, caused by a projectile passing through the neighboring tissues.

The following signs suggest penetration: (1) considerable chemosis; (2) orbitopalpebral hæmatoma; (3) protrusion of the globe; (4) frequent but not constant presence of blood in the anterior chamber; (5) soft ocular globe; (6) loss of vision; (7) immobile, deformed, dilated pupil; (8) insensitive cornea.

The author in general recommends temporizing; expectant treatment with disinfection will suffice if there are other important lesions to be attended to.

Wounds of the anterior segment are of two kinds; either the eye, partly empty, shows extreme hypertonia, or else there is a wound, with preservation of the normal form and consistency. This latter type is often considered to be a traumatic conjunctivitis, when in reality there is a penetrating wound. The patient should be carefully examined for signs of penetration. When there is penetration with the foreign body retained, an immediate toilet of the globe should be made. The eye is then submitted to the action of a large electromagnet which will extract any magnetic body. If the foreign body is not magnetic, a radiographic examination is made to find if the body is intra- or extra-ocular. Certain metallic foreign bodies are well tolerated by the eye, but others, such as copper, are badly tolerated.

In wounds of the anterior segment with hernia of the iris or of the ciliary body, it is necessary to excise these fragments. Enucleation should be the exception. An effort should be made to cover the conjunctival wound with the mobilized conjunctiva. The author describes his method. In the case of infection it may be necessary to enucleate.

Regarding sympathetic ophthalmia the author says that he has not observed a single case during the war. W. A. BRENNAN.

Kearney, J. A.: The Appearance of the Fundus Oculi in Certain Intracranial Conditions. *Med. Rec.*, 1917, xcii, 720.

Thirty-five cases of brain tumor were observed and thirty-two cases operated upon. From the standpoint of vision, a decompression is advised before the œdema becomes densely opaque because when this appears, gross destructive changes have taken place in the nerve and the time is passed when good vision may be assured. By an ophthalmoscopic examination of the fundus of the eye, many of the brain tumor cases are diagnosed as such for the first time only when sent to a hospital. It is of great importance, therefore, that every patient who complains of uncontrollable persistent headaches should have a careful ophthalmoscopic examination.

Intracranial hæmorrhage at birth is responsible for 70 per cent of the spastic type of paralysis in children and 20 per cent of the resulting idiocy and feeblemindedness now existing. One of the earliest indications of the existence of increased intracranial tension is determined by an ophthalmoscopic examination of the fundus of the eye. There is usually seen in the fundi of infants' eyes shortly after birth, when an intracranial hæmorrhage is present, a general œdema blurring all retinal and disc details, or a mild œdematous blurring of the nasal half of the disc, or rarely a measurable œdema occupying the entire surface of the disc. This observation is important because it indicates an increase in the pressure of the cerebrospinal fluid and lumbar puncture findings usually verify it.

Almost 1,400 children having spastic paralysis with or without mental impairment, of ages varying from 1 day to 20 years, have been examined with the ophthalmoscope to ascertain the presence or absence of an increased intracranial pressure due to hæmorrhage, and of this number 300 children have shown the distinct œdematous changes above described; that is, about one child in every five examined.

In cases of recent fracture of the skull, and especially basal fractures, an increase in the intracranial tension is usually the most damaging factor.

Frequent and careful observations are made while these patients are in bed. In cases uncomplicated by an increase in the intracranial tension, the retinal œdema gradually subsides. Occasionally, in some of the routine examinations, after the first twenty-four

hours following the accident, an increase is noted in the general œdema that previously existed, or to the œdema that heretofore blurred equally all details there is a decided added obscuration of the nasal half of the disc and its margins. These observations are valuable because they indicate quite early a rise in the intracranial pressure, and the spinal mercurial manometer will confirm it at lumbar puncture.

It is advisable that all cases of fracture of the skull be placed at complete rest in bed, with an ice helmet to the head, and free catharsis maintained. If no signs or symptoms referable to an increase in the pressure of the cerebrospinal fluid develop, the above treatment is all that is necessary; but if the intracranial tension is increased up to nearly double the normal, then in selected cases repeated lumbar punctures are done, depending upon the nature of the symptoms. If, however, the tension of the cerebrospinal fluid is found to be double the normal or even more at lumbar puncture, whether or not the pulse rate is lowered, then it is advisable to do a simple decompression operation before a possible collapse of the medulla occurs. EDWARD L. CORNELL.

Aymard, J. L.: A Cartilage Prosthesis for the Eye. *Lancet*, Lond., 1917, cxciii, 644.

The failure of the artificial eye from a cosmetic point of view depends upon immobility and depression. The former condition is due to the absence of a mass of tissue fitting inside the artificial glass casing, and the latter to the fact that a sphere has been replaced by a shell.

The author is now employing spheres constructed from costal cartilage as natural tissue prosthesis for the eye. Two hemispheres of cartilage are trephined from the eighth costal cartilage and are fixed together with cartilage or with catgut to form a sphere.

In primary enucleation the surgeon places the cartilage sphere inside Tenon's capsule and sutures the same, then sutures the conjunctiva. Whether cartilage spheres can be introduced into a septic eye socket remains to be seen. The author thinks it worthy of trial. V. C. HUNT.

EAR

Martino, P. J.: Latent Otitis of Early Infancy (Otites latentes de la première enfance). *Arch. de méd. d. enf.*, Par., 1917, xx, 476.

The frequency and gravity of otitis in infants renders its study interesting to the pediatrician. Autopsies of infants show how often otitis passes unnoticed during life. Barbillon in 27 autopsies of infants dying during the first month of life found suppuration of both ears in 25. Ponfick found suppuration of the ear in 91 per cent of infants treated for bronchopneumonia or gastro-enteritis; Gomperz found 90 per cent of suppurative otitis in infants dying with different affections.

In a great many cases the otitis of infancy remains latent for a considerable time without either localized pain or otoscopic signs. Many morbid conditions considered as primary infections of the digestive tract, pulmonary passages, etc., if they are not secondary to oto-naso-pharyngeal infection, are at least concomitant and due to a common cause. This cause has generally a purely anatomic basis, due to some defect of development.

Diagnosis of otitic infections, excluding cases of spontaneous perforation or of rapid localization of otoscopic signs, is ordinarily difficult, and the delay may give rise to complications which result fatally.

It may be admitted that in all general diseases of infancy the existence of an otitis media is the rule. When a febrile septicæmic condition persists, without other apparently attributable cause, the ear is probably the cause. Even when there are no clear local symptoms it is well to practice a paracentesis, which if done early and carefully brings about recovery in all positive cases and does not entail anatomic or functional complications in negative cases. W. A. BRENNAN.

Shambaugh, G. E.: Suppurative Otitis Media with Paralysis of the External Rectus. *Surg. Clin. Chicago*, 1917, i, 841.

The patient was a man 68 years old who had had a profuse purulent discharge from the right ear for eight months. A radical mastoid operation was performed, and because of persistence of discharge the wound was opened and tubal cells curetted, during which the internal carotid artery was punctured. Firm packing controlled hæmorrhage.

A few days later there occurred paralysis of the right external rectus muscle which persisted for eight months. The persistent discharge which continued for months after the last curettage, as well as the affection of the sixth nerve, was probably due to involvement of the apex of the petrous portion of the pyramid. OTTO M. ROTT.

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Guthrie, D.: A Clinical Lecture on Some Nose and Throat Diseases of Childhood. *Brit. M. J.*, 1917, ii, 355.

The author discusses briefly many common affections of the nose and throat, such as adenoids and hypertrophied tonsils, the tonsil operation, foreign bodies in the nose and air passages. It is not necessary to examine for adenoids with the finger, in the presence of very large tonsils. In such cases the presence of adenoids may be assumed.

Guthrie believes that the tonsils should be removed from all patients in whom the cervical glands at the angle of the jaw show enlargements. He mentions rheumatism as another indication. Many systemic conditions are due to the absorption of infection or toxins, and the tonsils of every patient suffering from some systemic condition ought to be carefully examined. JAMES J. KING.

Skillern, R. H.: Diagnosis and Treatment of Sinusitis in Infants. *J. Am. M. Ass.*, 1917, lxix, 895.

The author is of the opinion that so-called sinusitis in infants is misnamed and bears out the assertion by a consideration of the anatomical development of sinuses. He takes the age of five as the dividing line between infancy and childhood in sinus development. Of the accessory sinuses, the ethmoid is the only one which is well developed; the maxillary is small and rudimentary. Under two years the sphenoid is but an indentation; the frontal has not yet made its appearance. After the sixth year the true sinuses have become developed.

Localized sinusitis in infants has not come under the author's observation, nor has he found a case report in literature. Any disease which affects these sinuses in infants under two years does not limit itself to the maxillary sinus or ethmoid cells but affects the surrounding tissue as well.

The symptoms are of unusual severity, affecting the mucosa and the soft spongy underlying bone, destroying the side of the face involved, and often rupturing externally either above or below the orbit. In recent cases there is a profuse nasal discharge. The ethmoid cells are separated by layers of soft young bone which are as susceptible to disease as its own lining membrane.

The affection spreads to the canaliculi and appears externally on the face. If seen early, a thorough endonasal curetting of the ethmoid cells and antrum will prevent an external fistula.

Sinusitis in children over five years of age appears as a "common cold in the head," the discharge continuing until a sinusitis is present. It does not run so severe a course as in infants and has a greater tendency towards chronicity.

The author urges careful and thorough examination of these cases. Differentiation must be made from adenoids with postnasal suppuration; one sweep of the curette is sufficient. The source of the discharge can be established by means of the nasopharyngoscope. The author does not recommend the puncture needle. Transillumination is worthless. The roentgen ray is of positive assistance, since it gives an idea of the size, shape and condition of sinuses. In the beginning of an attack the condition can be brought under control by general and intranasal treatment.

Vaccines are found more useful than in any other sinus disease. If an operation is indicated, it should be done at once. The disease progresses so rapidly that unless immediate operative procedures are instituted extensive radical measures will be required to save the child's life. There is a previous stage during which proper treatment would have prevented exophthalmos, swollen lids, and hideous deformity from an abscess about to rupture.

Removal of the anterior and middle turbinate followed by antiphlogistic measures are recommended. The author first performs intranasal exenteration of the diseased ethmoid cells and maxillary antrum, with subsequent application of an organic silver salt. If there is considerable redness and swelling, a puncture large enough for a drain can be made on the face.

The author does not favor the Caldwell-Luc or any similar procedure through the canine fossa for maxillary sinuses. If the antrum alone is affected, any thorough intranasal operation will give a good result. M. A. BERNSTEIN.

Ingals, E. F.: The Intranasal Drainage of the Frontal Sinus. *Tr. Am. Laryngol. Ass.*, Atlantic City, 1917, May.

Ingals believes that in a large majority of cases of chronic frontal sinus disease, free drainage is all that is necessary, and that vigorous curettage is a bad practice, although gentle removal with a curette of polypi or granulation tissue, if present, would undoubtedly hasten the cure.

The furore for extensive mutilating operation on the frontal sinus has had its day, and now more conservative intranasal drainage is a practice that is generally accepted.

The author's attention was first called to the benefit obtained from intranasal treatment in 1893,

when he succeeded in curing two cases by intranasal treatment, as neither of them would consent to an external operation. As drainage into the nose was a prerequisite for treatment, he devised a burr with a safety guide to be run into the nasofrontal duct so that the duct could be enlarged permanently.

This burr made a canal 6 mm. in diameter, which, however, had a tendency to contract. To prevent the latter, a metal tube was inserted into the canal. This metal tube was superseded by the spring-gold self-retaining tube now in use. This may be worn for a number of years and permits free irrigation by the patient.

The author is convinced that the operation can readily be performed by any properly equipped laryngologist, and has placed the percentage of recovery of properly selected cases as high as 95 per cent.

Thompson, J. A.: An Unusual Infection from Ethmoiditis. *Laryngoscope*, 1917, xxvii, 643.

The infection was one of sciatica which cleared up after opening the bulla ethmoidalis from which a few drops of pus escaped. No other portion of the ethmoid was diseased. The patient made a complete recovery. OTTO M. ROTT.

Goldstein, M. A.: Sarcoma of the Nasal Septum; Laryngo-Epiglottidean Cyst. *Tr. Am. Laryngol. Ass.*, Atlantic City, 1917, May.

The patient, a male aged 56 years, eighteen months previous had begun to be troubled with occasional obstruction of the left side of the nose, continuing about a month, followed by relief and then recurrence. There was no history of epistaxis. Latterly there had been two or three attacks of nose-bleed, not very profuse. There had been no headache or pain of any kind. The patient had lost fifteen pounds in weight in six months.

Nasal examination showed a mass on the septum obstructing the left side. The right surface of the septum was infiltrated and thickened, causing some obstruction on that side. The nasopharynx was negative; the throat negative. There was no evidence of involvement of the accessory sinuses.

At operation the mass, together with the entire septum, was extirpated. Recurrence took place after one month. Histologic examination of the mass showed round cell sarcoma.

The second case, a boy twelve years old, had been hoarse since he was one month old. This had been ascribed to a "cold," and no laryngologic examination had been made. The condition seemed to remain quiescent until shortly before the boy was brought to the author for examination, at which time he had become very markedly dyspnœic. He was anæmic and frail, not cyanotic, and was unable to speak above a whisper. There had not been much difficulty in swallowing, and there was no regurgitation of food. Laryngeal examination showed a mass the size of a walnut on the left side, involving the laryngo-epiglottidean region. There was no fever. The mass was yielding to the touch and could easily be palpated with the finger. The mass was incised, the contents consisting of clear, yellow, sticky fluid. Subsequent examination of the vocal cords, examination of which had previously been impossible because of obstruction of view by the mass, was negative. The boy regained the use of his voice, though through habit he would speak in an undertone. There has been no recurrence of the cyst to date, and the boy now speaks in a normal voice.

Cavanaugh, J. A.: A New Method of Dealing with the Nasal Septum. *Illinois M. J.*, 1917, xxxii, 161.

In his new method dealing with the nasal septum, the author advises elevating the mucous membrane on but one side (concave) except where a spur or ridge exists and then he elevates the mucous membrane on both sides only in that area. He leaves the greater part of the cartilaginous structure intact, removing with his septum shave only small strips sufficient to adjust the parts to the median line, thereby preventing the possibility of a perforation. Where the bony part is deflected he makes multiple fractures in the deflected area with his bone forceps and pushes the bony septum to the median line. In cases where the cut edges of the flaps do not come together he puts in stitches. He always packs on the side of the convexity that existed before the operation.

THROAT

Stuart-Low, W.: Contributory Causes of Cancer of the Throat. *Practitioner*, Lond., 1917, xcix, 122.

The author mentions the following as being contributory causes of cancer of the throat:

1. Syphilis.
2. Oral sepsis.
3. Acidity of oral secretions.
4. Smoking.
5. Drinking hot fluids.
6. Eating excessively salted food.
7. Nasal obstructions.

The action of the above factors is explained on the ground that they irritate or render the throat less resistant to withstand irritants, either by denuding mucosa of protecting epithelium, or by diluting or drying the protective secretion, the mucus.

OTTO M. ROTT.

Dwyer, W.: The Control of Bleeding in Tonsillectomy. *Laryngoscope*, 1917, xxvii, 688.

Where simple pressure is not sufficient to control the bleeding, the author recommends catching the bleeding point with a Carmalt clamp and making a slight traction. Then with a full curved needle held in the needle forceps and threaded with iodin catgut, a stitch is taken just above and another one just below the clamp. The second needle is threaded to the free end of the first suture. By releasing the clamp, a purse string suture is made. OTTO M. ROTT.

Mackenty, J. E.: Surgical Treatment of Laryngeal Cancer. *Boston M. & S. J.*, 1917, clxxvii, 110.

Owing to the fact that very few cases of laryngeal cancer are seen early enough to justify treatment by thyrotomy, the author considers either hemilaryngectomy or total laryngectomy advisable. The author's technique is given in detail. A few of the important points mentioned are as follows:

1. The operation should be so conducted as absolutely to prevent blood entering the trachea during the operation.

2. Wound contamination from the open trachea and pharynx should be guarded against.

3. In total laryngectomy two lines of drainage are indicated: one just below the pharyngeal closure and the other just behind the tracheal stump, where it is secured to the skin. The latter is of prime importance, crossing, as it does, the direct path of mediastinal infection. In this situation, unprotected, weak iodoform gauze is used to promote adhesions. If the infection from above can be delayed a few days, and in all of the author's infected cases it has been so delayed, the danger zone behind the trachea is eliminated and a primary union between the trachea and skin promoted.

4. A nourishing and properly balanced diet is essential from the start. The only means of accomplishing this is by the use of the feeding-tube, introduced into the œsophagus through the nose and left in place until the wound is healed. In one case the patient was thus fed for two months without producing œsophagitis.

5. When infection occurs, strict attention to drainage is imperative. The dressings should be changed every two hours, or oftener, during the day and every three or four hours during the night. At each dressing a negative pressure pump is used to remove the pus and tenacious mouth and pharyngeal secretions from the wound.

6. When arytenoids are involved, it is almost certain that the disease has entered the lymphatics of the neck, necessitating their removal. If the median line is encroached upon, the dissection must include both sides.

7. As much of the anterior wall of the œsophagus as conditions demand should be removed. As much as one inch downward anteriorly and one-third of the circumference may be removed without producing subsequent stricture.

8. Diseased teeth should be removed at a period as long before the operation as possible.

9. In total laryngectomy the one-stage operation is preferred. OTTO M. ROTT.

MOUTH

Munger, C. E.: Tuberculoma of the Tongue. *Tr. Am. Laryngol. Ass.*, N. J., 1917, May.

The case is reported of a male, aged 30 years, whose tongue presented a crater-like cavity situated on the dorsum, at the junction of the middle and posterior thirds, in the median line, the prebase of the tongue. At the bottom of the crater was a marked ulceration covered with a yellowish slimy secretion, and from the central ulceration were narrow sharply marked ulcerations radiating to the circumference of the thickened and indurated mass.

The surface of the swollen mass was yellowish in color, and there was marked and exquisite tenderness upon the slightest pressure, with much pain at every movement of the tongue. This pain was localized and not radiating when the tongue was at rest. There was present also nigrities.

While the tubercular ulcer may be primary or secondary, a primary tubercular lesion of the tongue is extremely rare; although a few cases of tubercular infection of the tongue following traumatism have been reported. Speaking generally, the tongue is more often inoculated from the lungs than the lungs or larynx from the tongue.

The case reported presented a marked deviation from the usually reported situation of tubercular lesions on the tongue, which have almost invariably been stated to occur either on the tip or sides, this one being on the dorsum, a site on which a gumma is usually found.

The prognosis is not dependent upon the lesion itself, but depends wholly on the decision as to whether the patient is suffering from concurrent lesions in other parts of the body which are not susceptible to improvement, or is suffering from pulmonary tuberculosis, where there is a tendency to fibrosis. If the latter is the case, there is a fair degree of certainty that the tongue lesion may heal without local therapy, but if the pulmonary process is acute, with caseation and necrosis active, there is little chance of the tongue healing.

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SURGERY OF THE NOSE, THROAT, AND MOUTH

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